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SEVEN THESES OF LOGICAL POSITIVISM CRITICALLY EXAMINED II

IV

ACCORDING to the fourth thesis of logical positivism, "a logical analysis of language shows that the alleged propositions of metaphysics are pseudo-propositions (*Scheinsaetze*)",[1] and that they are "entirely without meaning".[2] But with respect to this thesis, too, the logical positivists are no longer in complete agreement. The most radical view has been advocated by Neurath, who seems to regard any "false and meaningless" proposition as "metaphysics".[3] His is the boldest attempt to repudiate metaphysics by definition.[4] Popper, on the other hand, spurns all "antimetaphysical" doctrines[5] and believes that at times metaphysical notions may be a distinct aid to empirical science.[6]

Carnap denies the possibility of metaphysics and presents the following argument to back up his contention: "All [meaningful] propositions may be divided into . . . tautologies . . . and empirical propositions. . . . Any attempt to formulate a proposition which is neither a tautology nor an empirical proposition must automatically lead to meaningless assertions. But metaphysics does not deal with analytical propositions, nor does it enter the field of the empirical sciences. Metaphysics, therefore, must necessarily deal with pseudo-propositions (*Scheinsaetzen*)."[7]

[1] Carnap, R., "Ueberwindung der Metaphysik durch logische Analyse der Sprache", *Erkenntnis* II (1931) 200.
[2] *Ibid.* 220.
[3] Neurath, O., "Soziologie im Physikalismus", *Erkenntnis* II (1931) 394.
[4] Gamertsfelder makes a similar charge against the entire Viennese group. *Cf.* Gamertsfelder, W. S., "Current Skepticism of Metaphysics", *The Monist* XLIII (1933) 116.
[5] Popper, K., *Logik der Forschung* (1935) 9.
[6] *Ibid.* 11.
[7] Carnap, *op. cit.* 236.

The conception of meaning underlying Carnap's argument has been examined in connection with the first thesis of logical positivism and has been found wanting; we shall not consider it any further. It is necessary, however, to point out that his argument as a whole lacks precision. To begin with, we must infer from the quotation just given that the empirical sciences deal with "empirical propositions"; but what is meant by "empirical propositions"? If they are identical with Wittgenstein's "elementary propositions", then, surely, it is not true that the laws of the natural sciences are "empirical propositions". Nor can they be *reduced* to "empirical propositions". For those laws are universal in scope, and their universality does not lie in the conjunction of particulars. If, on the other hand, the "empirical propositions" are akin to Popper's "foundational propositions" (*Basissaetze*), then the problem of their "empirical" nature has yet to be solved. In what sense can universals be regarded as "empirical"?

Carnap maintains, furthermore, that "logical analysis condemns as meaningless all alleged cognition which purports to reach beyond or behind experience".[8] "Experience", however, in the strict sense of the word, implies particular observations or awarenesses with reference to a here and a now. But the laws of the sciences, by virtue of their universality, "reach beyond" such experience; and if "all alleged cognition" which "reaches beyond experience" is "condemned as meaningless", then the "empirical sciences" must be discarded along with "speculative metaphysics"[9]—a conclusion which cuts the ground from under the Viennese contention that positivism alone provides an adequate basis for the natural sciences.

To this argument Carnap will probably reply that we have either misunderstood or deliberately distorted his basic contention, and that his phrase *"reaches beyond experience"* was not meant in the narrow sense in which we have made use of it. He will refer us, no doubt, to his samples of "metaphysical words",[10] and will point out that he meant to discard as meaningless only those terms which can be neither "verified empirically" nor deduced from "empirical propositions".[11] More specifically, Carnap will insist

[8] *Ibid.* 237. [9] *Cf.* Popper, *op. cit.* 9.

[10] Carnap, *op. cit.* 225-227.

[11] *Ibid.* 237. We shall not raise the question how the universal propositions of the "empirical sciences" can be "verified empirically" or deduced from

that he intended to discard, not the "empirical sciences", but "all speculative metaphysics . . . which considers experience unnecessary", and "all metaphysics which, though starting from experience, hopes to comprehend, by means of special arguments, that which is outside of or behind experience",[12] that which, in the words of Ayer, "underlies or transcends the phenomena which the special sciences are content to study".[13] That is to say, Carnap wants to discard all metaphysics which assumes that "there is a super- (or hinter-) phenomenal reality".[14]

It is generally admitted that there is little, if any, value in a speculative metaphysics of the type indicated by Carnap and Ayer.[15] But this does not mean that *all* metaphysics is in disrepute, nor does it imply that metaphysical considerations as such are necessarily without meaning. Aristotle's *Metaphysica,* for instance, is, for the most part, not a "speculative" undertaking disregarding experience but "a science which investigates being as being and the attributes which belong to this in virtue of its own nature",[16] and Nicolai Hartmann's illuminating discussions[17] show that metaphysics, conceived as *ontology, i.e.,* as an "analysis of categories", need not be "speculative" or "transcendent".

The problems of ontology are inescapable. The very fact that there are true propositions of the form (Ex). φx & ψx implies ontological questions; for the symbol (Ex) asserts *existence*—and existence in more than one sense at that. (Ex). φx & ψx may mean, for instance, 'There exists an x such that x is a rose and x is red'; or 'There exists an x such that x is 7 and x is a prime number'; or 'There exists an x such that x is the hero of a novel and x is a fictitious character'; or 'There exists an x such that x is my twin brother and x is nothing but a dream-image'. Now, surely, it is a legitimate and a necessary undertaking to determine

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"empirical", *i.e.,* "elementary", propositions. This question would lead once more to the "problem of induction", and we know already that this problem cannot be solved within the framework of logical positivism. See our discussion of thesis III (2).

[12] Carnap, *op. cit.* 237.

[13] Ayer, A. J., "Demonstration of the Impossibility of Metaphysics", *Mind* XLIII (1934) 335.

[14] *Ibid.* 339.

[15] *Cf.* Miller, H., "Some Major Confusions of Contemporary Positivism", Journal of Philosophy XXXII (1935) 515-517.

[16] *Metaphysica,* Ross edition, 1003a20-21. The "speculative" aspects are almost entirely restricted to 1069a17-1076a5.

[17] Hartmann, N., *Zur Grundlegung der Ontologie* (1935) particularly 1-87.

just what categories characterize existence in every one of these assertions, and to show if and how these categories are related to one another.[18] An investigation or demonstration of this kind, far from being an attempt to comprehend a transcendent reality, would lead to a better understanding of the world of experience. But, for all that, it would be metaphysics in the essential meaning of Aristotle's discussions of being as being; and it would be ontology in the unspeculative sense of Nicolai Hartmann's analyses.

The logical positivists, however, are up against metaphysical problems in yet another sense. Said Schlick: "Every investigator seeks to discover the rules, and nothing but the rules, which govern the context of experience and make possible the prediction of particular experiences".[19] The truth of this assertion may very well be denied;[20] but whether or not we agree with Schlick as to the facts in the case, it is obvious that any *reference to the future*—such as is implied in the idea of prediction—can have meaning only if we assign "some metaphysical status to time"[21] and to the experiencing subject which persists in time. Nor is this all.

What do the logical positivists mean when they say that "the object as distinct from the result of the particular experiment is *inferred*"?[22] What is the status of an inferred object? If "'reality' is independent of human wishes and desires"—as some positivists assert[23] and probably all of them believe—what are the categories that describe its independence, its mode of existence? Is the status of a thing the same as that of an idea? Are

[18] Ayer's attempt to rule out all considerations of 'being' (*cf. op. cit.* 342) does not solve the problems which arise in connection with these questions of existence.

[19] Schlick, M., "Positivismus und Realismus", *Erkenntnis* III (1932) 12 and 18. *Cf.* Frank, Ph., "Was bedeuten die gegenwaertigen physikalischen Theorien fuer die allgemeine Erkenntnislehre?", *Erkenntnis* I (1930-31) 134.

[20] *Cf.* Cornelius, H., "Zur Kritik der wissenschaftlichen Grundbegriffe", *Erkenntnis* II (1931) 196-197.

[21] *Cf.* Wiener, P. P., "Some Metaphysical Assumptions and Problems of Neo-Positivism", *Journal of Philosophy* XXXII (1935) 178.

[22] Blumberg and Boas, "Some Remarks in Defense of the Operational Theory of Meaning", *Journal of Philosophy* XXVIII (1931) 549.

[23] Blumberg, A. E. "Emile Meyerson's Critique of Positivism", *The Monist* XLII (1932) 67. Carnap, R., *Der logische Aufbau der Welt* (1928) 226-228.

physical objects in the same class with dream-images? And what is the status of hallucinations? Questions of this type always arise. They are legitimate and meaningful; and they are questions of ontology, of metaphysics.

Carnap distinguishes between "my present idea of the Cologne Cathedral and the building which my idea 'means' ".[24] He speaks of an "intentional relation" "between an experience and an order the structure of which resembles reality (*Ordnung von wirklichkeitsartiger Struktur*)"; and this structure he regards as "a more comprehensive context".[25] In these statements he clearly transcends immediate experience and the sphere of the individual, and he is up against the ontological question concerning the status or the mode of existence of the "more comprehensive context" which "resembles reality". Are structures which resemble reality real? If not, what are they? If they *are* real, how do they differ from reality, since, according to him, they only resemble the latter? And what does he mean by "reality"?

Carnap's argument that "physical objects are four-dimensional arrangements of qualities (or, better, of numbers which represent qualities)"[26] furnishes no answer to our questions. Nor does he fare any better when he says that "the relations conforming to law (which, as laws of nature, take the form of implications) are objective and beyond the will of the individual";[27] for such an argument merely leads into a metaphysics of laws and relations. The ontological questions concerning the mode of existence always return.

The most consistent as well as the most forceful presentation of what seems to me to be the ultimate meaning of Carnap's "relations conforming to law" has been given by Cornelius.[28]

[24] Carnap, *Aufbau* 226.
[25] *Ibid.* 221.
[26] *Ibid.* 227-228.
[27] *Ibid.* 250.
[28] Strongly influenced by Mach, Cornelius has published his ideas for more than 30 years. (*Cf.* Cornelius, H., *Einleitung in die Philosophie*, 1903; *Transzendentale Systematik*, 1916.) Following an invitation by the logical positivists, he has summarized his views in an article published in *Erkenntnis* (Cornelius, H., "Zur Kritik der wissenschaftlichen Grundbegriffe", *Erkenntnis* II (1931)). In an appended note the editors of *Erkenntnis*, on behalf of the Viennese Circle, have expressed far-reaching agreement with that part of Cornelius' summary which is of special importance for our discussion.

Though this writer is not a member of the Viennese Circle, I shall examine his argument, *as the strongest statement of the case,* in order to make my point against logical positivism.

Cornelius correctly maintains that the sciences deal with "things" which are "more permanent" than are our "fleeting perceptions", and that "every theory, by virtue of the orderliness which it affirms with respect to the data of immediate experience, far transcends every individual experience we may have".[29] But "the context according to law (*der gesetzliche Zusammenhang*)" which the sciences recognize is never a "mere summation of perceptions".[30] When we perceive a "thing" (an apple, let us say), we can see it from different angles and at various distances; we can touch it and can feel its smooth surface, its temperature; we can smell its fragrance and taste its flavor. And all "these appearances of the thing are definitely related according to law". In fact, "in as far as we know the thing through direct perception", Cornelius says, "we know nothing that is essential to it save this context of appearances according to law"; and "the thing, far from being a mere *sum* of appearances, is a *law* of appearances".[31] "The *form of a thing,* for instance, is but the *law* of the forms of its appearances";[32] while that which "we regard as the permanent color of a thing is always the *law* which determines the colors of its appearances".[33] The old question, therefore, of "how we can advance from the instability or transitoriness of sense-perceptions to the cognition of a world of permanent things", finds here an alluring solution; and it is essentially the solution implied in the "empirical" presuppositions of logical positivism: *"That which is permanent is the law of perception.* Or, stated more concisely: Only in as far as we can discover laws of perception can we obtain *something permanent* beside and above the eternally changing" data of immediate experience.[34]

It is obvious, of course, that the position just outlined does not avoid metaphysics—not even if we discard the ambiguous reference to things. Numerous questions of ontology arise at once.

[29] *Op. cit.* 195. [30] *Ibid.* 197. [31] *Ibid.* 201.
[32] A penny, for example, is a circular disk which appears elliptical from most angles; but a definite *law* of geometrical relations connects them all. And this law is the form of the penny.
[33] *Ibid.* 202-203. [34] *Ibid.* 203.

If laws govern appearances or perceptual experiences, what is the status of these laws? Surely they cannot be identical with sense-perceptions; for if they were, they would not be laws. Do they therefore exist "beside and above sense-perception" as determining forms? If so, we are evidently back in Plato's metaphysics of eternal ideas, and laws are being hypostatized into entities of some sort. Or are the laws of which Cornelius speaks forms which the subject imposes upon its "fleeting experiences"? If so, they are certainly not imposed by the empirical subject; for the objective compulsion involved in our experiences according to law defies all attempts to reduce it to purely subjective factors. Nobody can change the laws which constitute an apple into laws constituting a plum. And if the empirical subject is not the author of these laws, the metaphysical issues arising out of Kant's Copernican revolution recur with undiminished force. Even solipsistic interpretations do not enable us to escape from the metaphysical consequences of Cornelius' position; for solipsism, if considered to be more than a methodological starting-point, is in itself metaphysics. What, then, is the status of the "laws of perception" which alone are "*something permanent* beside and above the eternally changing" data of experience?

If it were argued that the laws are merely a device by means of which an empirical subject orders or arranges its immediate experiences, metaphysical questions would still arise; for does not the subject differ from its objects—even though the latter be only immediate experiences? What, then, are the categories which characterize this difference? Does the subject *produce* its objects? Does it *encounter* them as something given? In what sense are we to understand their givenness? Would anyone seriously maintain that the empirical objects of which logical positivists speak so often are *identical* with our perceptual experiences of them? If no such identity is affirmed, what differentiates an object from our perception of it? And what is the status of the objects when they are not perceived? But if the identity is affirmed, what do the positivists mean when they speak of an "empirically real mountain" that may be seen by many observers? Must we resort to a pre-established harmony in order to account for the fact that many subjects perceive the same

mountain? Or is there a real mountain which transcends the perceptual experiences of all subjects? What are the categories of empirical reality? How is it possible that logical deductions are valid for empirical objects? How can mathematical calculations anticipate future experiences? What are the presuppositions of a rational account of an empirical world? And how does it come about that all logical tautologies *are* tautologies for every rational subject? It is evidently impossible to change the basic "rules of the game"—as Weyl has suggested.

The questions we have asked are concerned with "first principles" and with "being as being". They all lead to problems of ontology, of metaphysics; and they are legitimate. To brush them aside as "entirely without meaning" implies a deliberate evasion of the problems involved, and an unwarranted curtailment of philosophical inquiry. But this is only another way of saying that the logical positivists, by defining metaphysics in a manner which is at once one-sided and obsolete, have blinded themselves to the real metaphysical issues; and that, for this reason, their fourth thesis is without philosophical significance.

V

According to the fifth thesis of logical positivism, "all fields [of inquiry] are but parts of a unitary science: physics".[35]

This view, now advocated by Neurath and Carnap, has evidently grown out of Carnap's doctrine of *"Konstituierbarkeit"*.[36] But while the latter was characterized by a certain broadness of vision, the former is one-sided and narrow in its basic presuppositions. Said Carnap: "It is the main thesis of the *Konstitutionstheorie* that all concepts can be derived from a few basic concepts";[37] "that all objects can be constituted out of basic elements which are 'my elementary experiences' ";[38] and that "all concepts of all the sciences can (in principle) be derived from one another and ultimately from a few basic concepts"[39] which "pertain to the

[35] Carnap, R., "Die physikalische Sprache als Universalsprache der Wissenschaft", *Erkenntnis* II (1931) 465.
[36] Presented in Carnap, *Aufbau.*
[37] *Ibid.* 1. [38] *Ibid.* 220.
[39] Carnap, R., *Scheinprobleme in der Philosophie* (1928) 8.

'given', to immediate experiences".[40] In the words of Lewis, this simply means that "reality as it is known in any case of actual knowledge can be nothing, finally, but a first-person construction from data given in the first person".[41] At this stage of the development of positivistic thought, significantly enough, the "data given in the first person" are not yet restricted to any particular type. Perceptual qualities as well as memory-images and feelings are among them. All this changes, however, when we turn to the new or physicalistic form of the positivistic thesis.

Neurath regards it as "essential" for the point of view of "physicalism" that "the concepts of the unitary science . . . always share the fate of the basic concepts of physics", and that "the unitary language of the unitary science . . . is the language of physics".[42] Carnap now believes that "all propositions—those of the 'protocol' as well as those of a scientific system—are translatable into the language of physics".[43] And he asserts that "because the language of physics is the basic language of science, science in its entirety (*die gesamte Wissenschaft*) is physics". "Every fact of science can be interpreted as a fact of physics, *i.e.*, as a quantitatively determinable property of a place in space-time (or as a complex of such properties)."[44] But the concepts of physics are not only "quantitative"; they are also "abstract and without quality". This is "important"; for Carnap maintains that "because these concepts are without quality, we can derive from them the terms of the protocols for any sensory field we choose".[45]

It would be absurd to maintain that the determinate qualities of sensory experiences (this green, that sour, etc.) can be *derived* from purely quantitative notions of space and time; for no logical manipulation of '$\lambda = 0.0000227$ inches', for example, will ever give us the sensory quality of yellow. And Carnap does not maintain that it does. But it seems equally absurd to assert—as he does—

[40] Carnap, R., "Die alte und die neue Logik", *Erkenntnis* I (1930-31) 24. See also Blumberg and Feigl, "Logical Positivism", *Journal of Philosophy* XXVIII (1931) 286.
[41] Lewis, C. I., "Experience and Meaning", *Philosophical Review* XLIII (1934) 128.
[42] Neurath, *op. cit.* 398.
[43] Carnap, "Physikalische Sprache", *op. cit.* 461, also 443 and 448.
[44] *Ibid.* 463. [45] *Ibid.* 443.

that the meaning of the *term* yellow can be derived from the meaning of '$\lambda = 0.0000227$ inches', without recourse to a qualitative experience; for the very fact that wave-length means color implies a specific and irreducible reference to sensory qualities.

When we turn to the notion of "reduction" as advocated by the representatives of "physicalism", further difficulties arise. Miller has pointed out that here the logic of Neurath and Carnap "is bad"; that the middle term of their argument is "undistributed", and that "both premises are false".[46] But Miller also realizes that this "bad logic" "would not necessitate the falsity of the conclusion" which the "physicalists" have reached. It is imperative, therefore, that we examine the conclusion itself. Can all data really be reduced to quantities in space-time?

The reduction to physics is obviously impossible as far as logic and mathematics are concerned. Carnap himself admits as much.[47] But he insists that this irreducibility of logic and mathematics is unimportant because "the formal sciences have no object". "They are systems of auxiliary propositions, without object and without content." And for this reason, he believes, "the clear-cut distinction between formal and empirical sciences does not affect in the least the unity of science".[48]

Carnap's assertion that mathematics and logic "have no object" rests upon the implicit assumption that objects (*Gegenstaende*) are something existing in space and time. This assumption, however, is not implied in the broad meaning of *Gegenstand* or object. Carnap's argument, therefore, presupposes a restrictive definition of terms which, as technical terms of philosophy, are being used in a much broader sense. But we shall not quibble over words. Following his own suggestion, we shall disregard the formal sciences in our present discussion.

The thesis of "physicalism" implies that all awarenesses must be interpreted as "bodily states".[49] "If we speak of 'The thirst of

[46] Miller, *op. cit.* 520. The positivistic argument, as Miller sees it, is as follows: "Physics deals only with measurable space-time relations. All immediate data are spatio-temporal quantities. Therefore all immediate data are reducible to physical description."

[47] Carnap, R. "Formalwissenschaft und Realwissenschaft", *Erkenntnis* V (1935) 32. *Cf.* Carnap, R., *Logische Syntax der Sprache* (1934). This book deals with Carnap's distinction between "Objektsaetze und syntaktische Saetze".

[48] *Ibid.* 36.

[49] Carnap, "Physikalische Sprache", *op. cit.* 457.

S_1'", Carnap says, "and do not mean the physical state of his body but his sensation of thirst, *i.e.*, if we mean something non-physical, the thirst of S_1 is in principle unknowable for S_2", and is therefore "without meaning".[50] The general problem of meaning involved in this assertion requires no further discussion; we have dealt with it already. But we must point out at this time that to attempt to reduce awarenesses—such as 'thirst', 'red', 'four', 'Pegasus' etc.—to nothing but bodily states is to overlook the fact that such a reduction always depends upon what Nagel has called "the implicit introduction of an *ad hoc* function correlating the quality with certain constellations of constituents".[51] And, surely, the *meaning* of a proposition P (Some roses are red) can be expressed in terms of bodily states only if we assert a proposition P (Such and such bodily states *mean the same as* 'Some roses are red') which presupposes our understanding of P; so that our reduction really moves in a circle and therefore is no reduction at all.[52]

Difficulties arise also in other respects. For instance, personality is hardly a matter of physics; for it involves not only consciousness of self and of an outer world, but also a unique wholeness which persists in time only because of a perpetual self-identification. The unity of personality, in other words, while empirically real, lies not so much in a specific aggregation of particles in space-time as in the focalized unity of an experiential context. And this unity is irreducible.

The living organism offers another problem. Although we may regard an organism as a system of physico-chemical effects, we cannot disregard the specific interdependence of the constituent factors nor the uniquely functioning unity which they constitute.[53] The physico-chemical laws governing the individual processes are not in themselves sufficient to account for their conjoint function within the living whole.[54]

[50] *Ibid.* 454.
[51] Nagel, E., "The Logic of Reduction in the Sciences", *Erkenntnis* V (1935) 50.
[52] *Cf.* Juhos, B., "Kritische Bemerkungen zur Wissenschaftstheorie des Physikalismus", *Erkenntnis* IV (1934) 401.
[53] The choice is not between mechanism and vitalism, but between physicalistic reductionism and an organismic view of life.
[54] *Cf.* Nagel, *op. cit.* 50.

However, the troubles of Neurath and Carnap are not over—not even if we dismiss as inconclusive the considerations pertaining to such concepts as organism and personality; for the thesis of "physicalism" rests upon an uncritical acceptance of the basic notions of modern physics—and of their implied metaphysics.[55] Space, time, and matter, in the sense of relativity and quantum mechanics, are taken for granted without further analysis, while the problems of space and time which animated Newton, Euler, Leibniz, and Kant, are entirely disregarded. That is to say, the "physicalists" have rejected the critical attitude of philosophy and have embraced instead a dogmatism that has only few rivals in the history of modern philosophy. Neurath's contention that "physicalism" is the "unitary science of *our time*"[56] (allowing, as it does, for some other unitary science at some other time) does not eliminate this dogmatism.

There is yet another point that deserves consideration. According to Carnap, the "physicalistic reduction" involves merely a "translation" of all terms into concepts of space- time;[57] it does *not* mean that all "laws" are reducible to the "laws of physics".[58] Neurath, on the other hand, places particular emphasis upon the fundamental "unity in law". For him, "physicalism is in evidence wherever we make scientific predictions based upon laws".[59] And while these "laws" may vary in "complexity",[60] it is his contention that "to-day we operate with the spatio-temporal system of physics", and that "this system is the system of the unitary science".[61]

This difference in the views of Carnap and Neurath is probably one of emphasis only. We shall not magnify it. But two problems arise. (1) If physicalism requires the translation of all propositions into statements concerning magnitudes in space-time, we soon encounter unwieldy propositions which obscure rather than clarify our meaning. As a practical example I urge the reader to translate into physicalistic language the proposition, 'The nervous system is the basis for centralized sensory-motor reactions'. I am sure that whatever meaning we can gather from the physicalistic translation

[55] *Cf.* Miller, *op. cit.* 517.
[56] Neurath, O., "Physikalismus", *Scientia* (1931) 303; also Neurath, "Soziologie", *op. cit.* 397.
[57] Carnap, "Aufbau", *op. cit.* 47; also "Physikalische Sprache", *op. cit.* 461.
[58] Carnap, "Physikalische Sprache", *op. cit.* 449.
[59] Neurath, "Soziologie", *op. cit.* 309.
[60] *Ibid.* 406. [61] *Ibid.* 397.

of this proposition is due entirely to our recollection of the original. And in view of this fact it remains a mystery how physicalism can be reconciled with the positivistic assertion that the sole purpose of philosophy is "the clarification of thought".

(2) If the laws of biology and those of psychology are "more complex" than the laws of physics—and Neurath admits that this is the case[62]—then either these laws involve an irreducible *novum*, or they can be derived from the laws of physics through some process of deduction. If the first alternative be asserted, the project of a unitary science is placed in jeopardy and must be abandoned as far as its physicalistic form is concerned. But if the second alternative is chosen, we must have recourse to synthetic acts of some sort; for the derivation of the "more complex" laws cannot be accomplished through tautological transformations alone.[63] It is not necessary to consider in detail the logical side of the problem; for modern physics, too, shows beyond doubt that "simple" laws can be derived from the "complex" while the "complex" cannot be obtained from the "simple". The relationship of Einstein's general law to Newton's law of gravitation illustrates the point; and wave-mechanics, accounting for the motion of particles, furnishes another example. If this argument is thought through to its logical conclusion, we realize that the laws of physics can be but special cases of more complex laws. And this means that the thesis of physicalism, in as far as it implies a reduction to physics, is directly opposed to the actual trend of the logical dependencies which alone constitute a reliable basis for a unitary science.

VI

The sixth thesis of logical positivism was first formulated by Wittgenstein. "The propositions of logic", he said, "are tautologies."[64] All members of the Viennese Circle subscribe to this thesis, and we would be the last to deny its truth. There are, however, three points which require further analysis.

(1) It is well known how Whitehead and Russell derived their system of logical propositions by means of specific rules from cer-

[62] *Ibid.* 406.

[63] The positivists themselves maintain that "deducibility is tautological", and that "the conclusion cannot contain logically any more than is asserted in the premises of the argument". *Cf.* Blumberg and Feigl, *op. cit.* 294.

[64] Wittgenstein, L., *Tractatus logico-philosophicus*, Prop. 6.1.

tain "primitive ideas" plus a limited set of postulates—much in the way in which Euclid developed his system of geometry. This procedure, however, implies a distinction between postulates and theorems—a distinction which the tautological character of the propositions of logic does not warrant. Wittgenstein recognized this fact and tried to overcome the deficiency of the "postulative" method by means of his own matrix-procedure. Carnap adopted Wittgenstein's method and used it exclusively in his logistics.[65]

It is not necessary to describe the matrix-procedure to readers of the *Philosophical Review;* its general scheme is universally known. But I should like to point out that the construction of a matrix presupposes a pre-logical and *a priori* knowledge of at least three basic principles—identity, contradiction, and the excluded middle. True, Carnap shows how these principles can be derived by means of the matrix;[66] but this derivation is only a *secondary* matter. Consider, for instance, the following matrix:

p	q	$-p$	$-q$	$-p \,\&\, -q$	$p \vee q$	$(-p \,\&\, -q) \vee (p \vee q)$
T	T	F	F	F	T	T
T	F	F	T	F	T	T
F	T	T	F	F	T	T
F	F	T	T	T	F	T

It is evident that the stipulation of two and only two truth-values, T and F, presupposes the principle of the excluded middle.[67] The same principle underlies the derivation of the truth-values of $-p$, $-q$ etc. The principle of contradiction also plays its part in this procedure. And the fact that T, F, p, q, etc., retain their original meaning regardless of their position in the matrix is due to the implicit assumption of the principle of identity, $A = A$; for change of position *could* entail a change of meaning—as may be seen from our usage of writing numbers by position.

Furthermore, the tautology $(-p \,\&\, -q) \vee (p \vee q)$ can be obtained only by advancing step by step from the left-hand column to the right-hand column of the matrix; and this advance is possible only because of a specific integrational relation of the columns in ques-

[65] Carnap, R., *Abriss der Logistik*, 1929; also "Alte und neue Logik", *op. cit.* [66] Carnap, "Logistik", *op. cit.* 12.

[67] All three-valued 'logics' involve psychological elements of doubt, and for this reason are not matters of pure 'logic'.

tion. In other words, it is possible only because the matrix as such is a *synthetic whole*. The matrix-procedure, therefore, verifies Kant's well-known contention that "synthesis is the first thing which we have to consider, if we want to form an opinion on the first origin of our knowledge".[68] This conclusion is further substantiated by the fact that Carnap himself introduces the "rules of syllogistic inference" as synthetic postulates.[69]

Our findings are not altered by the fact that the "tautological character" of a "proposition of logic" "can be recognized by analysing it in isolation";[70] for the principles of identity, of contradiction, and of the excluded middle, as well as certain synthetic relations, are always implicitly assumed in such a procedure. A logistics which consistently refuses to accept basic meanings and primitive syntheses,[71] can attribute no significance to its symbols—not even through the use of "implicit definitions".

(2) Having recognized the tautological character of the "propositions of logic", logical positivism "maintains as a fundamental thesis that there are no synthetic *a priori* propositions".[72] Although this repudiation of apriorism is directed primarily "against Kant",[73] Ayer extends it beyond its original scope by insisting that *"no* knowledge is both synthetic and *a priori*".[74] And to such a contention exception may well be taken.

After all, Kant's doctrine of synthetic judgments *a priori* is by no means representative of apriorism as such;[75] and whatever may be said in criticism of Kant's views need not apply to apriorism in general. On the contrary, Kant conceived the problem of the

[68] Kant, I., *Kritik der reinen Vernunft* A77-78, trans. Max Mueller.

[69] Carnap, "Logistik", *op. cit.* 10-11. In the Whitehead-Russell system, the postulates are "synthetic", and the rules can be derived from them. For instance, the postulate of permutation yields the *modus tollens*, while the postulate of summation leads to the principle of the syllogism, and ultimately to *Barbara*.

[70] Blumberg and Feigle, *op. cit.* 283. Also Carnap, "Alte und neue Logik", *op. cit.* 21-22.

[71] "Primitive" is here used in the sense of *Principia Mathematica*.

[72] Blumberg and Feigl, *op. cit.* 282.

[73] *Cf.* Carnap, "Alte und neue Logik", *op. cit.* 23. Behmann's admission that "geometry consists 'essentially' of *synthetic* propositions" because "the axioms, in particular, are not logically self-evident", spoils the simplicity of Carnap's argument. *Cf.* Behmann, H., "Sind die mathematischen Urteile analytisch oder synthetisch?", *Erkenntnis* IV (1934) 8, also 10.

[74] Ayer, *op. cit.* 336.

[75] *Cf.* Hartmann, N., "Das Problem des Apriorismus in der Platonischen Philosophie", *Sonderausgabe aus den Sitzungsberichten der Preussischen Akademie der Wissenschaften*, Phil.-Hist. Klasse, 1935, XV.

a priori in so narrow a sense that he is responsible in a large measure for the confusion which to-day beclouds the issues of apriorism, and constructive criticism of his interpretation should therefore be most welcome. The question is, Can logical positivism provide this criticism?

Cognition *a priori* is not primarily a matter of synthetic judgments; nor is it restricted exclusively to the realm of thought. Its basic form is an "inner vision", an intuition; and this is discernible even in perception. But the *a priori* elements are always the condition without which a comprehension of particular objects is impossible. Everywhere they are "a necessary presupposition". We can recognize the sequence of our experiences only because of an *a priori* knowledge of temporality, and we can speak of objects of the external senses only in terms of an *a priori* spatiality. Our discussion of the Wittgenstein-Carnap matrix-procedure has shown that even the "tautologies" of logic rest upon *a priori* conditions which we comprehend intuitively—or not at all. Every choice we make involves an *a priori* consciousness of values; for values determine the choice, and not *vice versa*. And Nicolai Hartmann has shown beyond all doubt that even our prejudices rest upon an *a priori* basis.[76]

I cannot settle the problems of the *a priori* in this brief article; but I can and do protest against a too hasty dismissal of the issues involved. And if my protest should lead to discussions of apriorism in the broad sense of the term, it will have served the purpose for which it was intended.

(3) The third point that arises in connection with the sixth thesis of logical positivism transcends still further the field of "pure" logic and touches upon problems which traditionally have been regarded as epistemological. This point may be stated very briefly; for it is an undeniable fact that the implicative structure of logical dependencies is not merely a matter of thought, but concerns also the "empirically real world". What, then, are the presuppositions of this manifest harmony between "logical dependencies" and "empirical interrelations"?

What I have in mind here is essentially Kant's question concern-

[76] *Cf.* Hartmann, N., *Ethik*, 1st edition, pp. 103-117; *Grundzuege einer Metaphysik der Erkenntnis*, 2nd edition, pp. 327-334.

ing the possibility of the "science of nature".[77] Of course, I am not suggesting that Kant's solution be accepted as final; but, surely, the more consistently we interpret logic as a system of tautologies, the more urgent is it to find an answer to his question. And we can hardly expect a satisfactory answer from the logistic doctrine according to which propositions are but "sequences of 'ink-marks on paper' and sequences of 'air-vibrations', which under certain conditions can be regarded as equivalent".[78] What else do the positivists offer?

VII

Finally, the logical positivists inform us that "pure mathematics is nothing but logic";[79] that "all mathematical concepts can be derived from the fundamental concepts of logic",[80] and that "every mathematical proposition can be translated into a proposition concerning logical concepts".[81] This thesis, of course, is not new. It underlies *Principia Mathematica* and has been explicitly stated by Russell.[82] Its adequacy, however, is a different matter.

One of the crucial problems involved in this thesis is the definition of cardinal numbers. Carnap rightly admits that unless we can define numbers in purely logical terms, we "must introduce the concept 'cardinal number of a class' as an undefined basic concept", and that, as a result of such introduction, we would also "be in need of new axioms concerning its qualities".[83] The complete fusion of mathematics and logic would then be impossible.

In order to escape this consequence, Carnap endorses the well-known definition given by Russell[84] and maintains that "cardinal numbers are classes of equivalent classes".[85] But does this definition really bridge the gap which, traditionally, has been assumed to

[77] *Cf.* Kant's *Prolegomena*, Carus edition, pp. 50-84.

[78] "Verknuepfungen von 'Tintenhuegeln auf Papier' und Verknuepfungen von 'Lufterschuetterungen', die man unter bestimmten Bedingungen gleichsetzen kann, nennen wir Saetze". Neurath, O., "Protokollsaetze", *Erkenntnis* III (1932) 209.

[79] Behman, *op. cit.* 13.

[80] Carnap, "Logistik", *op. cit.* 2.

[81] Carnap, "Alte und neue Logik", *op. cit.* 21.

[82] Russell, B., *Introduction to Mathematical Philosophy* 194.

[83] Carnap, "Logistik", *op. cit.* 51.

[84] *Cf.* Russell, *op. cit.*, Chapter ii. See also Kronecker, L., "Ueber den Zahlbegriff", *Journal fuer die reine und angewandte Mathematik* CI (1887) 342.

[85] Carnap, "Logistik", *op. cit.* 50; "Aufbau", *op. cit.* 54; "Alte und neue Logik", *op. cit.* 23.

exist between logic and mathematics? Does it really satisfy the requirements of arithmetic?

The meaning of number is, of course, twofold: ordinal and cardinal. In any actual situation, however, both meanings are inseparably interwoven; for where there is a *first*, there is necessarily a *one:* the *one first;* where there is a *second*, there are also *two:* the *first* and the *second*, and so on. Conversely, where there is a *one*, this one is also the *first;* where there are *two*, there is necessarily a *first* and a *second*, and so on. The one meaning always involves the other. They differ, however, in logical significance. The ordinal meaning, while always implying the cardinal meaning, does not presuppose the latter and may be defined without reference to it. The cardinal meaning, on the other hand, does presuppose the ordinal meaning and, for the purposes of arithmetic, cannot be defined without reference to it.

The meaning of ordinal numbers ultimately rests upon an irreducible and synthetic act of mind, known as enumeration. Through this act, the numerically indefinite and indifferent aggregation of 'something' *and* 'something' *and* 'something' *and* 'something' *and* 'something' *and* . . . (where the word *and* is a conjunction rather than a symbol of addition), is being transformed into the sequence of a *first* 'something', a *second* 'something', a *third* 'something', a *fourth* 'something', and so on. The natural numbers are but the abstract and symbolic fixations of the various stages in this "act of counting".[86] And it is this act, and this act alone, which gives meaning and significance to everything that is being done in arithmetic and in the dependent branches of mathematics.

To be sure, Russell and the logical positivists may have succeeded in giving us a general definition of the concept 'cardinal number'; but the requirements of arithmetic demand more than this. They demand a *specific* answer to the question, *How many?* And such an answer the members of the Viennese Circle cannot give. The best they can do is to say, *Just as many*. Arithmetic, however, cannot be based upon such a generality.

The logical positivists may now maintain that we have failed to consider their position in its entirety and that they are able to construct, in a purely logical manner, a number-system within

[86] *Cf.* Kaufmann, F., "Bemerkungen zum Grundlagenstreit in Logik und Mathematik", *Erkenntnis* II (1931) 279.

which each specific class of equivalent classes possesses a definite numerical value. And they may argue as follows: Suppose the class m of equivalent classes be given; it is then possible to form a class n of equivalent classes, such that every class of n contains 'one more'[87] element than every class of m. There may be formed also a class $(n + 1)$ of equivalent classes, such that every class included in $(n + 1)$ is by 'one' greater than every class included in n. Since m was arbitrarily chosen and may therefore be *any* possible class of equivalent classes, it is obvious that the relationship which was stated for n and $(n + 1)$ with respect to m, really holds with respect to *all* numbers. In other words, it is possible to arrange all classes of equivalent classes in a progressive series of such type that every class of equivalent classes is by 'one' greater than its predecessor. And within this series every class of equivalent classes, *i.e.*, every cardinal number, has its specific numerical value.

No doubt, the classes of equivalent classes can be arranged in the manner just indicated. But it is also certain that the *numerical* value of the cardinal numbers can be derived from the serial arrangement *only if the ordinal meaning of numbers is taken into consideration.* To be more specific: If 3, 5, 7, 100, . . . are classes of equivalent classes, they possess definite *numerical* values only because they occupy, respectively, the *third*, the *fifth*, the *seventh*, the *one hundredth*, . . . place within the established series. And thus it comes about that, in the last analysis and despite all logical efforts to prove the contrary, *the ordinal numbers alone give meaning to the numerical values of cardinal numbers;* that they are the indispensable condition of the cardinal meaning required in arithmetic. And ordinal numbers cannot be derived from purely logical concepts.[88]

But this is not all. The irreducible and synthetic act of enumeration, giving rise to the meaning of ordinal numbers, is also the indispensable condition of the meaning and significance of addition, subtraction, multiplication, and division. These mathematical

[87] 'One more' could be defined as: One of n 'left over' when we attempt to put m and n into a one-to-one correspondence.

[88] Hilbert recognized this fact and allowed for it in his formalistic system. *Cf.* Hilbert, D., "Die logischen Grundlagen der Mathematik", *Mathematische Annalen* LXXXVIII (1923) 154-156; "Die Grundlagen der Mathematik", *Abhandlungen des mathematischen Seminars zu Hamburg* VI (1928).

operations can no more be derived from purely logical concepts and relations than can the numerical values of cardinal numbers. True, $m + n$, for example, may in some sense correspond to 'p & q' and to 'p v q';[89] but, surely, the meaning of the additive *plus* is never the same as that of the conjunctive *and* or of the disjunctive *or*.

Even were we to disregard our entire argument as advanced up to this point, the positivistic thesis that "pure mathematics is nothing but logic" would still be untenable; for it is well known that mathematical proofs presuppose the "axiom of infinity" as well as Zermelo's "axiom of selection",[90] and that as yet irrational numbers cannot be defined without recourse to Russell's "axiom of reducibility".[91] But not one of these additional axioms can be regarded as a tautology; not one of them is a "purely logical principle". It follows that mathematics and logic cannot be fused in the manner prescribed by logical positivists,[92] and another thesis of the Viennese Circle must therefore be discarded.

If it be objected that in our discussion we have unduly emphasized the requirements of arithmetic, we maintain that our demand to satisfy these requirements is relevant and, indeed, inescapable; for the very foundation of arithmetic is at stake. Were we to relinquish our demand, we would be betraying the interests of mathematics and would render no service to philosophy.

In a recent article C. W. Morris, referring to the "scientific empiricism" of the Viennese Circle, stated: "As yet in America this temper of scientific empiricism has not become sufficiently critical, and the lack of a sufficient number of counter-irritants in the form of orthodox metaphysicians may help to explain the large residue of uncritical speculation in many writings which claim to be scientific".[93] Though I would hardly classify myself as an orthodox metaphysician, I venture to believe that the discussions just presented may in some measure serve as the hoped-for counter-irritant.

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[89] The principle of commutation, for example, holds for all these forms.
[90] *Cf.* Dubislav, W., *Die Philosophie der Mathematik in der Gegenwart* (1932) 40.
[91] *Ibid.* 42.
[92] Carnap's refutation of objections to his thesis does not affect the points we have raised. *Cf.* Carnap, "Aufbau", *op. cit.* 54.
[93] Morris, C. W., "Some Aspects of Recent American Scientific Philosophy", *Erkenntnis* V (1935) 149.

TOWARD METAPHYSICS OF SPACE

ALLOW me to commence my argument with a fantastic picture. Imagine a tree endowed with consciousness. Such an eccentric botanical specimen will face an equally eccentric world, not with the crown freely bathing in air and sunshine, but with the roots where most of its problems are to be met. There in the dark and crowded cells of the underworld will arise before its eyes, adapted for subterranean vision, an intricate and many-colored universe filled with strange, non-Euclidian forms. Its eager botanical mind will project new skies, and clouds, and wide horizons, into the regions of the "palpable obscure" where, for us, nothing but the "mournful gloom" and impenetrable stone reign. Infinite variety of difficulties in obtaining food and adjusting vision will give rise to an infinite variety of methods to overcome those difficulties. The tree will call them 'things'. To us they will seem strangely liquid and evasive things, mere ghosts of the subterranean kingdom. The water fumes would take the form of the most tangible reality, the substance from which all the tools for obtaining and modifying food would have to be prepared: hammers, and axes, and war weapons. Whereas the hard and impenetrable rock—an entirely useless, and therefore empty, existence, a mere obstacle in the path of reaching toward things—would be perceived as a kind of void, something like our interstellar space that cannot be reached; an indifferent and purely negative, separating medium, an obstacle *per se*.

The beautiful 'outside', the leaves, and branches, and flowers, will not perceptibly exist for the tree. They are the organs of digestion and reproduction, and will therefore be vaguely felt as the dark and mysterious 'inside'. The infinite space above, the moons and the stars of our galactic system, will never be even surmised as being anything apart from the 'inner' organs of the tree. Sun, of course, must be there; and the tree will be somehow aware of its existence. But it will be there—minus the gulf that separates us from it; an object of visceral sensations, described by the scientists as a mysterious factor causing much discomfort and hunger by periodically stimulating digestion. As to the stars, there will be no way of conceiving such things except in the highly symbolic form

of a tensor equation, or some other technical formula of higher mathematics. Of a direct contact with other trees our spiritualized specimen will never be aware. A forest fire will probably be perceived as an infectious disease caused by a special carrier inhaled through the roots. And if some stirrings of the leaves be caused by the branch of another tree touching them on a stormy day, the mysterious tremor felt inside will surely be attributed to mental telepathy. At any rate, the roots will seem to convey far more dependable information than the foliage facing the bright and transparent infinity of the open space which, to the tree, will be nothing but the dark and congested 'inside', a universe shrunk to the size of a leaf. The tree will regard our astronomical universe with its terrific speeds and gigantic celestial bodies as an episode in its own life, as a microcosm, and call it 'my body'. It will be blind to the presence of the whole universe within itself.

This fantastic picture may be reversed, and applied—negatively—to ourselves. From the point of view of a tree so romantically endowed with consciousness, our own mind and life will seem an equally paradoxical affair. Our senses reveal to us, as we are firmly convinced, the infinite space outside, in which we are seemingly free to move. But the laws of space remain everywhere the same. Hence moving in empty space from one place to another, however distant from the first, we will appear to be moving within a vast identity. From the tree's point of view we shall seem to be just as stationary as the tree is from our point of view. We do not move at all. For we remain within the same geometrical body of laws. Nothing is changed, if we traverse even a billion miles. Our contact with reality (I am still speaking for the tree) occurs on the 'inside', within the intricate organization of our own cells and genes, amidst our 'roots'. A real cosmos lies in ourselves, within our biological organisms, amidst the vast expanse of interatomic forces, in the domain of the infinitely small.

These reflections may seem offensive to those who are 'statistically' and 'scientifically' inclined. Do I need to explain that it was not about a tree, but about ourselves and our common blunders in thinking, that the tale was told? In our contact with reality are we not altogether too often deceived by wrong perspectives similar to that of our hypothetical tree, perspectives which compel us to

'see' void, and emptiness, and separation, where there is none? Are we not commonly impressed beyond proportion by the immensity and magnificence of the 'universe without', and a little unmindful of the 'infinity within ourselves'? According to Riemann, who was neither a theologian, nor a metaphysician, but one of the greatest minds in modern mathematics, it is not from finite things and numbers, but precisely from the domain of the infinitely small, from the differential, that we may hope to obtain a key to the secrets of nature. And was it not Hermann Cohen, one of the ablest representatives of modern 'scientific' philosophy, who identified reality with the differential? As though in compliance with their prophetic voices, modern physics has really attempted to deduce the properties of the whole universe from the differential, ds^2.

To the ordinary, unsophisticated view nothing seems plainer than the apparent fact that the outside world, the abode of innumerable stars and planets, is immensely large, if not infinite; whereas the inner world of a biological organism is a minor, almost negligible affair in the life of the whole. Is this apparent axiom not perhaps an outgrowth of what to a superior intelligence may seem an aberration of our terrestrial logic, just as the failure of our hypothetical tree to see the bright sun seems to us an effect of its subterranean logic? The whole view according to which the entire universe is divided into two unequal compartments, the outer and inner world, may very well be a result of our wrong metaphysical orientation. The vast expanse of the 'universe without'—is it not merely an effect of an assumed perspective, of a certain intuitional approach? Does Nature in any way resemble that empty void, the 'gulf', as Eddington calls it, which separates things from us, the spectators? Or is it merely an appearance, the effect of a point of view? And, on the other hand, are we not facing a much more vast infinity inside ourselves? If we knew all that was going on in our bodies, if we could intelligently penetrate under the protective cover of the bones, and *see* how blood is being made within their dark cavities, each atom would grow into a star, and immense horizons would be opened to our view.

Thus the abysmal vastness and emptiness of space; its character of a box which contains matter, or of an immense void into which phenomena are projected, and in which they are visualized as exist-

ing outside of one another; the property of outwardness or externality which is described by such words as 'horizon', 'distance', 'depth', and the like; in a word, all those attributes which are commonly regarded as unquestionably real, and the negation of which is always branded as mysticism—are, nevertheless, the most doubtful and the least accurate of all geometrical properties. They are all creatures of intuition. And intuition is precisely what is not real and not true in geometrical relations. Under the effect of intuition the elements of space, 'points', appear to be primarily external to one another, so that "the absence of one point is without effect on the others". But this is obviously an illusion arising from the mechanism of intuitional projection, and not at all characteristic of space itself. For what in intuition appears as bare separation and indifference, a gulf or void, is in reality a relation, hence a connection, not merely externally attached to both points (as it appears in intuition) but intrinsically built upon, and supported by, the nature of points. Objects which seem inaccessibly distant, because we can never reach them, may from another point of view seem indefinitely close, as sun to a plant. If certain conditions were fulfilled, as Poincaré suggested, we should be able to touch objects at a distance, and to see them only at a very close range. Distance is great or small relatively to the amount of effort necessary to overcome it. It has meaning only as a factor in the mechanism and organization of matter, as Aristotle already pointed out. What is 'out there' is an intuitional projection, a function, of what is 'in here'. The manner in which the geometrical points and physical atoms exist outside of one another depends upon the inner structure of the atoms, and, ultimately, of the points. "The atoms", writes Borden P. Browne, "are viewed as sown in space, each shut off from the rest by a void, across which nothing passes, and yet each incessantly adjusts itself to all the rest by virtue of an opaque harmony between them."[1] This elegant and beautiful formulation of the Leibniz-Lotze tradition needs only this correction, that the harmony is not *between* but *in* them. The great universe without is an 'out'-come, perhaps merely a stage in the evolution of a point. *Ex* is a function of *in*.

[1] B. P. Browne, *Metaphysics* 121.

I have ventured to illustrate this by reference to two hypothetically different types of consciousness. I hope that the illustration may prove useful as a suggestive device. But it is admittedly inconclusive, as it is based on a fantastic assumption. Let me now demonstrate and describe the suggested relation by the legitimate means of logical analysis. It is my intention in what follows to furnish a preliminary examination, however incomplete, of the nature, implications, and mutual relations, of 'in' and 'out' in their most general signification, with the view of perhaps throwing some light upon the relation of the mental ('inner') to the physical ('outside world'). The puzzling features in the problem of 'body and soul' are to a very large extent due to the confusion caused by geometrical interpretation of abstract words, especially prepositions; and are insoluble in proportion as the geometrical interpretation based on intuition is misleading. It may, therefore, prove important for every student of philosophy once again to perambulate, and—as Mr. Laird suggests—even to lose his way in, the intricate structure of those familiar simplicities called 'in' and 'out'.

Among philologists it is customary to support the view that originally 'in' and 'out' were designed to express spatial relations. This is a mere assertion. It is at least subject to reasonable doubt whether the world of primitive people is wholly identical with our geometrical, and geometrically impersonal, universe. From the linguistic point of view there is an element of 'tendency' and 'tension' even in pure geometry. Space is defined as *ex-tension, i.e.,* the domain of ex-relations, 'outs' in tension against one another. In this definition the dual personality of space is clearly brought to light. It is not merely an aggregate of points, not a chaos of 'outs'; but an organized cosmos, a tension of points in relation to one another. It is not a pure and abstract *ex,* but ex-*tension.* The points are *out*side of one another, only in so far as, and only because, they are *in* space. Hence 'in' and 'out' are two sides of one thing, extension. Let us call them ex-relation and in-relation of space.

After Kant it became customary to designate the difference between those two fundamental relations of space as one between extensive and intensive magnitudes. The terminology, although rather obscure and misleading, was approved by mathematicians, and found in mathematics a fruitful application and further de-

velopment. Following Kant, H. Grassmann classifies what he calls continuous forms into intensive and extensive magnitudes. Intensive magnitude is produced by continuous generation of identical material (*durch die Erzeugung des Gleichen*); whereas the extensive magnitude originates from differences (*durch die Erzeugung des Verschiedenen*). In the first case the generating element remains invariant and self-supporting; in the second case it is constantly changing, and exists only as supported by others.

At the same time, Grassmann is fully aware that both intensive and extensive magnitudes are mere abstractions; that the difference is one of emphasis, not of kind. "It is clear", he writes,[2] "that every real magnitude can be regarded in a twofold manner, as an extensive and intensive one. Even a line can be conceived as an intensive magnitude if one abstracts from the manner in which its elements are located outside of one another, and considers only the quantity of the elements. And similarly a force, a typical example of intensive magnitude, can be represented as an extensive magnitude, as it can be visualized in form of a line."[2] In other words, even the intensive magnitude is, after all, a magnitude, and can, as such, be represented and measured by discrete units of distance, in a manner in which temperature, for instance, is measured by the height of the mercury-column. Similarly the extensive magnitude has in itself an intensive factor, in so far it is a magnitude *of something* which is not itself a magnitude but only *has* it. This latter consideration is especially significant; as it tends to show that every extensive magnitude has an extra dimension.

Grassmann's definition of intensive and extensive magnitudes roughly corresponds to, and is implicitly based upon, a more abstract distinction of 'in' and 'out'. As a mathematician, Grassmann remains in the field of relations much too concrete to serve as logical foundations of space. The philosophically important feature of his analysis rests with the realization of the systematic interdependence of the two types of magnitude. This interdependence reflects itself, or is rather a reflection of, a more fundamental reciprocity in the sphere of abstract relations. The in-relation and ex-relation of space, not yet crystallized into magnitudes, are nevertheless so closely connected that one is quite unintelligible

[2] Hermann Grassmann, *Die lineale Ausdehnungslehre* 27.

without the other. This reciprocity should not be given the trivial interpretation, based on intuition, that every kind of geometrical inclusion presupposes exclusion and *vice versa*. Thus the dictionary defines the original meaning of 'in' as "expressing motion or direction from a point outside to one within limits". Hence it is from a point outside that something is judged to be within, and *vice versa*.[3] Such interpretation renders the whole argument a commonplace. I said: what from one point of view appears to be 'in' may (and must) from another point of view be regarded as 'out', and *vice versa*. 'What a profound remark!', an empirical realist will probably interject. If you are *in* your garden, you are *out* of your room; and if you are *in* your room, you are *not in* your garden. What is the point of talking about such trivialities? Well, the point is precisely that we are not talking about such trivialities. The empirical realist—who, mind you, does *not* as a rule believe in the power of intuition, and is very eager to impress you with the alleged fact that in mathematics you cannot depend on intuitional evidence—refuses, in practice, to consider any other evidence but intuitional, and is ever ready to criticize as mystical any attempt to penetrate beyond what he can 'see' with his pseudo-geometrical eyes. He attacks us as being trivial. But suppose we tell him that 'in' and 'out' are relative, not merely as locations, but in a far more fundamental sense in which distance and simultaneity in physics are relative; that what is 'in' a point is literally 'out' over the whole space, and what is 'out' of a point is somehow 'in' it, then, he says, we are talking nonsense, and he refuses to understand us. It is, he insists, mysticism.

Incantations against mysticism in modern philosophy have become very popular and very irritating. Whatever one philosopher does not understand (sometimes deliberately) in another, is branded as mysticism. The above statement ('what is out of a point is somehow in it') may be unintelligible, if one stubbornly refuses to understand it; but it is not mystical in the historical sense of the word. It requires no supernatural ability, and claims no revelation.

[3] Comp. P. Natorp's *"Auseinanderhaltung und wiederum Vereinigung des Auseinandergehaltenen" (Die logischen Grundlagen der exakten Wissenschaften* 73). In an effort to render the idealistic position absurd and ridiculous, the neo-realists simplify the idea of interdependence of the elements of space to a similar kind of pseudo-dialectical banalities. *Cf. New Realism.*

It simply describes what is found in those concepts apart from the 'intuition'. Let us see what that is.

Once again: What is 'in' is 'out' there; what is 'out' there is 'in' here. This apparent dialectical nonsense is nevertheless a very precise description of what actually happens in the relation of 'in' and 'out'. In order to define the meaning of 'in', pure and abstract, we must first of all eliminate any intuitional reference to boundaries. For within spatial boundaries, however small, we always have both 'in' and 'out'; the points 'within' a certain boundary lie 'outside' of one another. Hence to obtain a condensed 'in', we have to confine it to a point. But within each point, p, we have the whole character of space—'spatiality' or 'externality'—fully defined. This character—Plato would call it the idea of space; in Riemannian geometry it is called the 'fundamental tensor'—is not merely represented in each point, but is actually in there; it is what makes it a point of this particular space, say R_3. It is in this sense, and only in this sense, that the entire space is said to be contained in each point. This is merely another way of saying that each point is a point *of* space, *i.e.*, is subject to the same geometrical legislation as all other points, and carries that legislation in its own existence as a point. Precisely the fact that all other points, however near or distant, are 'out'-side of a given point, is included in that legislation, and is the basic fact about it. For the 'outness' of all other points rests with the nature of p. Hence externality as the fundamental property of space, full and complete, is present in every point making it what it is, a point of a given space.

Mathematicians should not feel offended by this quasi-mystical terminology. If the mathematician, putting aside his cultivated dislike for philosophy, will ever give himself the trouble really to understand what the philosopher says about space and time, he will discover that the latter only states in words what the mathematician himself implies by his symbols. I, for my part, humbly admit that the ideas here expressed present but little novelty, and are scarcely anything else but a verbal paraphrase of Riemannian geometry. For, according to Riemann, not only abstract externality is determined by differentials (points), but the specific manner in which the points of a space exist outside of one another is also based upon the structure of *ds*. In other words the texture of space depends

upon the structure of points. For mathematically different kinds of geometry, *i.e.*, different textures of space, can be deduced from the nature of the differential underlying each space. It is in this sense that the differential is sometimes (Cohen) called the reality or substance of space, in the old meaning of the word 'substance' as ὑποκείμενον, or underlying the texture. Riemann has devised a method for constructing an unlimited variety of spaces, all contained in the formula:

$$ds^2 = a_{ik}dx_i^2\,dx_k^2,$$

where i and k are to be summed from 1 to n according to the number of dimensions. What Aristotle says in his *Physics* about the straight line becomes thoroughly intelligible only in the light of this formula. He says: "Necessity in mathematics is in a way similar to necessity in things which come to be through the operation of nature. Since a straight line is what it is, it is necessary that the angles of a triangle should equal two right angles; . . . if the angles are *not* equal to two right angles, then the straight line is not what it is either" (II 200a). From Riemann we know that if the angles of a triangle are not equal to two right angles, our space has a curvature, and a straight line is not a (Euclidian) straight line but a geodesic. Paraphrasing Aristotle, we may say that if the point (= ds) does not satisfy certain conditions, then space is not what it is either. The only difference between Aristotle and us in this respect is that Aristotle believed he knew what space is, and we do not. For him space was unquestionably a Euclidian manifold of three dimensions, whereas for us it depends entirely upon what kind of fundamental invariant, ds^2, we assume as underlying its texture.

Far from being the simplest element of space, the point must be regarded as logically the most complex phenomenon in geometry. For, apart from containing *in nucleo* all geometrical relations, it suffers also from a superimposed logical complexity; being what is called a mere abstraction, it involves a multitude of logical and epistemological relations, whereas as an element of physical space it involves time, which reference is mathematically defined by the form of the so-called fundamental tensor. As a differential, the point is not a negation of extension, volume shrunk to nothing, but the generating principle, the origin of space. The point,

defined by its position (*situs*), is, according to Leibniz, *fundamentum extensionis, cum extensio est positionis repetitio simultanea continua, ut lineam fluxu puncti fieri dicimus, quoniam in hoc puncti vestigio diversae positiones conjunguntur.* Intuitionally the point, indeed, presents a strangely paradoxical case of an extensive magnitude from which all extension has been removed, a geometrical 'thing' so small that it no longer exists. But intuition, as mathematicians well know and admit, is a very poor source of information. As a limit or differential, the point is full of reality. To be sure, it is not filled with other points, in which case it would not be a point, but a set of points. But in its abstract isolation and, as it were, infinite smallness it is nevertheless a cosmos, a *locus* of intrinsic relations, and even equations, which define the *manner* in which all other points of the same space are external to one another: "la matière," says Leibniz, "est dans le point aussi bien que dans le corps."

A cross-section of that cosmos becomes apparent in the manner in which the elements of space lie outside of one another, *i.e.*, in the geometrical organization of space, and becomes intuitively evident in such things as distance, depth, etc. But what is intuitively evident is merely a part of that reality which is latent in the point. We know now that a purely geometrical point is a mere abstraction. Its three principal components: dx, dy, dz, cannot properly be detached from the fourth, $-cdt$, which, even though not directly equal to time, is in physics assumed to be proportional to time, and with which the other three constitute what Weyl calls the "amalgamation of space and time". The physical properties of the entire universe depend upon what is found in a point, *i.e.*, upon the structure of ds. The question whether our universe is finite or infinite, contracting or expanding, depends upon the form of the tensor attributed to space-time, that is, ultimately, upon the structure of its linear element. Riemann was right: physical reality rests with the differential.

Now physical and geometrical reality—call it nature, if you wish—is common to all points. Hence points in space are not only externally connected (or disconnected) by distances, but also intrinsically connected (and disconnected) by a common geometrical

and physical legislation. It is only intuitional aberration that makes a point or event here on earth entirely independent of, and indifferent towards, an event occurring somewhere, say, in the nebula of Andromeda. The two intuitionally *appear* separated by a cold and indifferent gulf; but they *are* inwardly and closely related, nay, in a sense, identical, in as much as they are both manifestations of the same body of laws. The gulf may indeed be cold, but it is not indifferent. It is teeming with innumerable wires, relations, connecting the two spots, as it were, *per hiatum irrationalem*, by a sort of imaginary short-cut, avoiding space.

Again, there is nothing mystical in such a conception. The connection need not be supernatural, and requires no second vision. Many perfectly obvious relations which may connect two points, however distant, are *not* conducted *via* space. The two points are, no doubt, related and connected in a logical way, by being points, *i.e.*, abstractions; in a geometrical way, by being points of the *same* space; in a physical way, by partaking of events; even biologically, if you wish, by securing the kind of space in which life can exist. Of the entire mass of such connections only few are known to us. There are, no doubt, many others of which we have not the slightest notion, and which are necessary to secure the coherence of the whole geometrical machine. Hence space cannot be constructed and accounted for on the basis of ex-relation alone. Its points are not merely 'out'-side of one another, not only separated, but also inwardly connected. However distant they may be from one another, they know each other very intimately. The cold indifference of distance is merely an appearance. Metaphysically, distance is alive. It is full of tension and in-tension. All points belonging to the same space have but one essence, which, far from being mystically occult, can even be mathematically expressed by means of a tensor equation. This is especially true with regard to the points of our physical space, which are intimately connected with time, and must be so constructed as to make matter, life, and mind, possible. Not in every kind of space could matter exist; and—who knows?—perhaps only one of all the innumerable spaces geometrically possible is suitable for the development of Mind. All this depends upon how points are built.

The manner in which they lie outside of one another, *i.e.*, geometry, is merely one of the innumerable consequences of their inner structure.

Thus logically there are two fundamental properties of space. One is defined as the manner in which the points of space are external to one another. We call it externality. It is common to all spaces. The other, in contrast to externality, may properly be designed as *connectivity*. It is also common to all spaces, and may be defined as the manner in which the points of a given space determine the geometrical character of that space. Connectivity does not join points externally, by means of an intuitional gulf, but intrinsically, by formulating the law of their affinity. For instance, if the infinitesimal linear element of space, ds, satisfies the condition that $ds^2 = dx^2 + dy^2 + dz^2$, it defines a space, namely, our Euclidian extension; if the same infinitesimal element—call it a point—satisfies the condition that $ds^2 = dx^2 + dy^2 + dz^2 - cdt^2$, it defines the space of special relativity, and so forth. These formulae connect the points of space and hold them together more rigidly than iron rods. For iron rods can be destroyed, disintegrated, or at least simply removed. But those intrinsic ties are irremovable and indestructible. And yet they are not intuitional, not in the nature of external relations. If one were nowadays allowed to use the style of the early fathers of the Church, one could say that those ties "connect the points without connecting them". But such paradoxes, however descriptively correct, are not appreciated in our days. Again, they seem too mystical. But why is not the gulf mystical that we believe we see with our "carnal" eyes? Is it less mystical and more intelligible because we see it? If it were real, it would probably be the most unintelligible thing in the whole creation.

But fortunately for the world the void and spectral gulf which we identify as empty space is not real. It is an effect of intuition, a way of seeing things. It could not be real. For the 'gulf' that we 'see' as space renders all points in it helplessly isolated, and so completely strange to one another that "the absence of one point is without effect upon the others". This phrase, coined by the neo-realistic school, is notable for its descriptive precision. 'Out' there in the 'gulf' the points of space are, indeed, complete

strangers to one another. The curious part of it is that, contrary to the neo-realistic intention, the phrase does not describe the space itself in its realistic objectivity and independence, but only our intuition of space, *i.e.*, precisely the subjective element in it. If viewed 'out' there in the 'gulf', *i.e.*, intuitively, the points seem wholly indifferent to one another, hopelessly lonely, and incomprehensibly isolated. It is precisely this isolation that is beyond reason, not their affinity; and what is beyond reason is commonly regarded as mystical; hence it is the experimentalist's view of space which is mystical, not ours. Logically, and even mathematically, one point is never without effect upon all others.

This can be shown by the following argument, which has, in principle, been suggested by Royce. Imagine, if you can, a single point annihilated in space. Mathematically, then, all functions at this point would become discontinuous. All concentric circles and spheres around that point would lose their fundamental property of being circular or spherical, for there would be *no point* from which all their points were equidistant. In other words, there will be no such circles; and since the set of such points is identical with *all* points of space, there will be no space. There will be many other absurdities. The whole space would inevitably collapse. For the space in which we live cannot exist with a hole; it would be a different space. Thus the absence of any one point in space makes all the difference to all other points. There is something in each point which, if destroyed, would be equivalent to the destruction of the whole space. Every single point supports and sustains the entire geometric machinery, just as every single moment of time supports and sustains the whole eternity.

Thus a point cannot really be empty. Each point is a center where the essence of space abides. As a differential it is pregnant with reality, and the most tangible reality. For the tangible reality, our motley world in space-time, depends upon the nature and structure of ds^2. What we find out there in the open space, in the wide 'universe without', is merely an intuitional replica of what in a condensed form is found in the differential. Just as the roots of our hypothetical tree transform their immediate neighborhood into a fantastic world, so does our own intuition transform the physical order of things, which finds its expression in differential equa-

tions, into a geometrical one, and present the world to us as extension. Hence the relation between the 'inner' and 'outer' world seems to be precisely the reverse from what it is commonly believed to be—a situation to which philosophy has never ceased to call the attention of science, and to which recently, after centuries of stubborn resistance, physics has also given her assent. The 'universe without', with its shapely geometrical forms and figures, with its terrific distances and wide horizons, is a matter of intuition only; it depends upon the mechanism of perception, and is in all probability nothing but appearance. This, however, does not mean that geometry is not real, or that space does not exist. It only means that space does not exist as a gulf to be *angeschaut;* that in reality geometrical relations have neither shape nor form; and they cannot be seen with carnal eyes, as the Fathers of the Church were in the habit of saying. Modern science says exactly the same thing, only in different words: geometry is not a matter of intuition. Thus we come to a conclusion which is as old as it seems eternally puzzling. What is commonly believed to be real and material, the outside world, is really mental, in the sense that it is an intuitional projection of a non-intuitional order of things. And what are commonly regarded as mental, the symbolic formulae of mathematics with its differential equations, with its tensors and vectors, are real, in the sense that they afford us at least a glimpse into the objective structure of things as they are in themselves.

On such premises the incompatibility between matter and mind ceases to exist. If the real, material world were built upon the foundation furnished by our "carnal eyes," if it resembled the things that we 'see' and 'hear' out there in the 'empty gulf', 'we' would not be possible as minds. In such a world we could not exist. For, as it has been argued again and again, we as minds have no extension; hence no location, no place in the extended universe. But if the universe has extension only metaphorically, if the infinite void is nothing but a picturesque symbol like 'red' and 'blue', the main obstacle to the reconciliation of matter and mind will be removed. We still do not know how they are related to one another; but we at least realize that there is nothing incongruous or contradictory in their relation, and even coöperation. Mind can

very well be an outcome of matter; for matter itself is a highly attenuated and spiritual affair. We have departed quite a good deal from the nineteenth-century quarrels. The new philosopher familiar with the modern developments in physics finds nothing repugnant in materialistic doctrines; whereas the scientist begins to grope, however vaguely, for suitable metaphysics, and often arrives—like Eddington and Jeans—at a highly spiritualistic conception of the universe. As a matter of fact, in view of modern developments in physics *and psychology*, the terms 'materialism' and 'spiritualism' have become entirely out of date. And even though they are still charged with traditional hostility, which is intensified by our social and economic unrest, in reality they have become wholly ephemeral, and their controversy degenerated into a mere political waving of arms. The philosopher, however, only derives from the situation a new and difficult task: watching his basic antinomies descend from the sublime to the ridiculous, he only realizes the necessity of a radical revision of all metaphysical values.

In partial fulfillment of this task the present article was conceived. The reader will remember the allegorical story of a tree endowed with consciousness which was introduced as a prelude to the present discussion. It was then suggested that, if such a fantastic botanical specimen could reflect upon the world-conditions, it would probably reverse the order of magnitude and the scale of importance among things. An intricate and endless world would arise before its roots. But the free expanse of our light-ridden universe with its innumerable suns and planets will assume the form of a dark, impenetrable rock against which our human roots are desperately rubbing and gnawing; or, still more likely, will be perceived as the innermost recess of the vital organic forces, as something that sustains the organism from the 'inside'.

The picture is admittedly unprecise. The inner world of an organism, even though it is in itself a cosmos condensed to almost a drop, is nevertheless conceived in the light and in terms of external relations. However small, it still occupies some volume in the surrounding space. Thus our picture ends, so to speak, half way between 'in' and 'out'. But roughly speaking it is true, for it suggests the right direction in which externality logically resolves

itself into connectivity. All we have to do to make the picture exact is to reduce the 'inner world' of our hypothetical tree to a point. Every simple geometrical element, then, becomes pregnant with reality. In so far as that reality can be measured, it constitutes a new dimension. For, according to Leibniz, "per dimensionem nihil aliud intelligimus quam modum et rationem, secundum quam aliquid subjectum consideratur esse mensurabile, adeo ut non solum longitudo, latitudo profunditas sint dimensiones corporis, sed etiam gravitas est dimensio, secundum quam subjecta ponderantur".[4] The further we scientifically penetrate into the structure of microscopic units of life and matter the more complicated they appear to be. The number of problems and mysteries is not decreased by division, but increased. We are not nearer, but farther from the ultimate goal than ever. And yet we are proud of the progress of science. Why? Because we now see infinite horizons where only fifty years ago we could see nothing but the impenetrable substance of a solid atom. We have at least in one respect attained a goal: each atom has become for us a star, and the earth beneath our feet has turned into a new sky

> . . . too starry for eyes to explore,
> Denser with stars than the midnight, from rim to the crystalline core.
> Not the intense radiations that keep stellar hydrogen thin,
> But radiance massed into metal, the force of the lightning shut in.
> Infinitesimal masses, immune to the lightning that kills,
> Spinning so fast that they seem and they are the immutable hills.
> It is exquisite ultimate order, electric, etherial, sane,
> And why should it fashion the eye of a man to behold it as pain?[5]

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[4] *Regulae ad Directionem Ingenii.*
[5] Edwin H. Lewis, *The Physicians.*

GENTILE'S *SISTEMA DI LOGICA*

GENTILE'S metaphysics has often been described. He carries the idealistic tendency toward the reality of the mind to its logical conclusion by recognizing only the act of thinking in its essential unity. But the argument by which he arrives at this position has not been described and is seldom understood. The destructive criticism of the *Teoria dello spirito come atto puro* is available in Carr's translation; but the systematic exposition of actual idealism contained in the *Sistema di logica,* which is foundational to all of Gentile's other writings, and which he himself has described as the constructive expression of his philosophy, remains unavailable to all but a few. It is the purpose of this article to present one major argument of the *Sistema di logica,* divorced from the technical paraphernalia by which it is often obscured in that two-volume work, in an effort to show the path by which Gentile has arrived at a doctrine so immediately uncongenial to most of his contemporaries. Gentile's logical system merits minute examination; it is unique even among idealistic logics. But even more important are the metaphysical and epistemological considerations which are involved in establishing it. They are not only unique but of unquestionable significance.

Gentile is engaged in a study of the metaphysics of truth. According to him there are three elements which, when gathered in a judgment, make it true; value, necessity, and universality. The history of philosophy has shown but one way of providing these elements. A separation has always been made between judgments and that about which judgments are made, between the knowing and the known. The norm of thought has always been objective in relation to thought. But what happens when the truth-value of this norm is brought into question? We are faced with an extraordinary situation. Consider the official meter in a bureau of standards. How do we know that it is exactly a meter? We know because we define the meter in terms of it. But we cannot do the same in the case of the norm of thought without begging the question: we cannot define truth in terms of that which is merely assumed to be true. Strictly speaking the official meter is not a meter; it is an arbitrary section of platinum. But truth, in

contrast, cannot be arbitrary; it must be objective and necessary. As long as the norm of thought is objective in relation to thinking it must be taken on faith. It is Gentile's position that in the realm of philosophy the act of thinking (*pensiero pensante*) and its norm must be intimately connected. There have been many attempts to bridge the gap between the two. The Cartesian attempt was in terms of innate ideas; Locke relied upon the phenomenal character of simple ideas; Kant tried to effect a connection by combining perception and conception; and the modern attempt is to combine intuition and reflection as principles of knowledge. But the predicament, called by Mr. Sheffer the logocentric predicament, has always returned.

Gentile starts his inquiry, then, with the rejection of a norm which transcends the act of the knowing subject. The only path which remains is that of a full and complete immanentism. It should not be imagined that in avoiding the difficulties of the logocentric predicament he has been able to free himself of all objections. It is generally agreed that the difficulties involved in his position are greater than those of any doctrine of transcendence. He must show that the act of thinking is not determined by anything extrinsic to that act, that it is *norma sui*. He must show that the act of thinking possesses necessity, universality, and truth-value.

The first criterion is that of necessity. Is the act of thinking a necessary act? Is the necessity of the act immanent in it? In other words, when one thinks, will this thinking be necessary? Gentile finds his necessity in the principle that when a person thinks he thinks to the best of his ability. If the best of his ability recommended another possible assertion as true, that would be the one he would assert. *This necessity cannot be denied: the very denial of it would be an assertion of it, for the denial would have to be necessary in order to carry weight.*

The second criterion of truth is that it be universal. Necessity and universality are so related that either is established in establishing the other. In what sense is the act of thinking universal? Is it the same for all men? In a sense the question whether or not it is the same for all men may not even be asked. For the actual idealist other men exist only in the reality of thought, since nothing transcends thought. 'Other men' are empirical individuals; even

their acts of thought are unreal, because they only partake of reality in so far as they are created in the act of thinking. Gentile argues that the act of thinking is universal not because other men arrive at it independently but because, in the freedom of his thinking ('freedom' in the sense of being free from presuppositions), the thinker is under the necessity of thinking what he thinks. The universality is this, that if another man had Gentile's intellectual background he could not think otherwise. *The very assertion that two men moving from identically the same position might think differently is, by its nature as an assertion, a denial of this possibility. Every assertion is the assertion of its own universality, or it would not be asserted.* If the norm of thinking is to be contained within the act of thinking, this is the only universality which knowledge may enjoy. The universality of the Gentilian truth being within his act of thinking carries with it the implication that the truth for any empirical individual must be found within his act of thinking and nowhere else. This is a principle which is often recognized; but the metaphysical and logical significance of it is seldom considered. One person does not accept the thinking of another as true without himself performing a thinking act of sanction; *and this act, rather than the thinking of the other person, is that ultimately which supplies the value.*

The third criterion is that of value. Gentile finds that any assertion has value. *Any assertion that denied it value would commit suicide; for being an assertion its whole power is in the value with which the asserter endows it in the act.* The value is not given by anything objective to the act of thinking. In that case the entity which was objective to thinking would contain the value. The thinking of an opponent does not lack value *for Gentile* because of its inconsistency. It lacks value *for him* because it cannot be truth *for him* until it is asserted by his own act of thinking, until he himself asserts it as true by a free act.

Consider a few illustrative examples. Take, for example, the syllogism. The conclusion 'Socrates is mortal' does not in a final analysis follow from the premises, 'All men are mortal', and 'Socrates is a man', because of a logical principle which establishes a relation between the terms. Such a principle would have to be examined for its truth-value. The truth of that syllogism is contained in the concrete assertion, *'I think* that all men are

mortal'. In this assertion, *so far as I think it*, there is contained the assertion that Socrates is among the class of mortals. Deductive logic is notorious for its circularity. But no deductive process is ultimately true until its postulates are asserted by virtue of an 'I think . . .'. Mr. Sheffer has shown that any investigation of the logic of thought must be a logical procedure. We must break out of the circle somewhere: Gentile does it by asserting the necessity, universality, and value, of the 'I think . . .' which expresses the act of thinking.

Take a judgment from the *Monadology*. "These Monads are the real atoms of nature and, in a word, the elements of things." As a part of Leibniz's knowledge this has value, is necessary and universal. As mere opinion it would have no more value than its contrary or its contradictory. Either could as well be entertained. It would stand on the same level as either a contrary or a contradictory opinion expressed by another individual. But *for Leibniz when he wrote it* it was true and therefore subject to no one of the three vagaries of opinion. To another thinker, with different intellectual perspective, this assertion may be inconsistent with its background. This other thinker would make another and different assertion. But in Leibniz's place that other thinker would not think otherwise.

Perhaps the clearest illustration of the Gentilian doctrine is found in education. When a child announces the sum of two and three as six, his calculation is error in relation to the truth of the teacher. But it must be remembered that the answer given by the teacher is not the result of operations which the child is in a position to follow and which, therefore, constitute the child's knowledge. If it were the child would, of course, give the answer desired by the teacher. It is an accurate description of the situation to say that the calculation of the teacher is *for the child* in error in relation to the child's own truth. It is essential to Gentile's doctrine to believe that the individual thinks to the best of his ability. If there is an inconsistency in the child's thinking it does not appear to the child as such. No individual deliberately thinks inconsistently. When the teacher points out the inconsistency in the child's thinking, *and the child recognizes it as such*, then and only then does the child alter the affirmation. 'Two plus three equals six' will be true to the child until he himself accepts 'Two plus three

equals five'. Why cannot Gentile consider that a case in which the norm (the arithmetical system) is objective to both pupil and teacher? One reason is that an entity objective to both *is not a norm until accepted as such.* By what standard is it a norm? In arithmetic the standard is a purely arbitrary one: we could just as well have a system in which two and three equals six as one in which two and three equal five. We mark the child who says, 'Two plus three equals six', wrong according to the standard accepted by custom. But assuming that the child accepts that standard, 'Two plus three equals six' is still right to him *according to his understanding of the accepted standard* if he affirms it. It is right to him until his own understanding alters it. This principle Gentile applies to all knowledge. "To thine own self be true" is for him an epistemological imperative. We are forced to think the truth not by anything objective to the act of thinking, but by our own free act of understanding, which contains its own norm. This is not a coherence-theory. Both pupil and teacher will have coherent arithmetical systems so far as each understands his system, otherwise the affirmations would not be made. But nevertheless each is to the other wrong.

Certainly the most difficult illustration to explain is the familiar judgment, 'Edinburgh is north of London'. If Edinburgh is north of London it *is* north of London, we say. The value of our judgment of the relation seems to be limited by the external facts of the case. But an analysis of the logical process involved shows that in asserting 'Edinburgh is north of London' we are accepting some basic criterion of northness. Perhaps we accept the assertion that if when we depart from A in the direction indicated by a magnetic compass we come nearer to B, then B is north of A. That, or any other criterion of northness, is founded in a system of geographical concepts which have been freely accepted. It is Gentile's position that the acceptance of this system gives the judgment value. If this were not true, we could not even refer to the 'external facts of the case'; for the very assertion of these 'facts' is the assertion of the system of which they are a part. Otherwise 'Edinburgh is north of London' would be a meaningless jumble of words. Gentile argues that any reference to that which is objective in relation to the knower contains the free acceptance by the knower of a criterion according to which that

reference is either true or false. In logical language, any judgment is part of a deductive system and is given value by the postulates which characterize that system; and the postulates, being postulates, are given value only by the 'I think . . .' with which the thinker vitalizes them.

Previous to the *Sistema di logica* there were but two major positions with regard to the criteria of truth, that they transcend the act of thinking and that they do not exist. The former is the doctrine of traditional metaphysics: according to Gentile Spinoza's concept of Substance places even him in this group. The latter is the doctrine of scepticism and neo-positivism. The contribution of Gentile is the suggestion of an adequate defence of a third doctrine, which lies midway between the other two and affirms that the criteria of truth are immanent in the act of thinking. Actual idealism agrees with the traditional metaphysician that necessity, universality, and value, are essential to philosophic truth: it agrees with the neo-positivist that these criteria cannot transcend the act of thinking without renouncing their value-giving power. Gentile employs both the arguments by which the neo-positivist arrives at his non-metaphysical position and that by which the traditional metaphysician resists his attack. Too often the agreements are forgotten and the disagreements allowed to breed distrust.

The traditional metaphysician interprets philosophy as that science which gives a self-consistent description of the real. There are so many varieties of this science that it is difficult to make statements about it broad enough to include them all. But it is true of all of them that the criteria of truth transcend the act of thinking and therefore can only be known by immediate intuition. All such doctrines consider the significant stage in philosophical research to be not the intuiting, but the reflecting upon that which is intuited. Metaphysicians are dependent upon their intuitive insights *as poets* rather than as philosophers for the raw materials with which they work. In other words they make assumptions upon two levels. First they assume that 'truth' and 'reality' have objective meanings (*i.e.*, transcend the act of thinking); and then they assume certain immediate intuitions with regard to the nature of 'reality'. For some it is monistic, for others dualistic; for some it is mystical, for others it is rational. An assumption on the first level is made by every philosopher. It is an assumption as

to the nature of philosophy, and opens up at least two legitimate possibilities, that 'truth' and 'reality' shall transcend the act of thinking and that they shall not. Gentile has the support of both sceptics and neo-positivists in choosing the second of these possibilities, realizing that the traditional metaphysician is for his metaphysical result more indebted to the poetic than to the rational function of man once he has asserted that 'truth' and 'reality' transcend the act of knowing. But he is certainly to be criticized in the *Sistema* for not recognizing that thinkers may legitimately take the first path, that they may interpret the function of philosophy differently than he does.

The neo-positivist makes quite a different assumption on the first level. He takes the function of philosophy to be a study of the nature of knowledge rather than a description of reality. Indeed 'reality' is for him a meaningless term in any but its usual significance. He takes the further and unique position that there is no entity which ultimately makes thinking true or false. A necessary and universal 'truth' is omitted from his system. For him philosophy is the building up of hypotheses with regard to the nature of the cosmos and to an acquaintance with it, and the testing of these hypotheses pragmatically as we move toward new and more useful hypotheses. Philosophy is not a science of knowledge; it is a method of procedure. But Gentile is right in pointing out that even the hypotheses of the neo-positivist require the later presupposition of a certain (*e.g.*, uniform) type of cosmos. If there were no such presuppositions there could be nothing on which to base an hypothesis. Even a theory of probability is dependent upon a principle which is not regarded as a pure probability. In this case, as in that of the traditional metaphysician, there is not only the assumption on the first level as to the function of philosophy, but also the dependence upon an assumption on the second level as regards the nature of the cosmos. In this case the assumption is that of common sense; and the metaphysics of the neo-positivist is the metaphysics of common sense, and subject to all of the criticisms which the neo-positivist levels against the traditional metaphysician. The only difference is the insistence of the former that the function of philosophy be so interpreted that the metaphysics of common sense is the only possible one. Gentile is right in asserting that the neo-positivist in seeking to avoid metaphysics has

not succeeded in doing so; but he is wrong in asserting that neo-positivism is untenable.

In short, actual idealism is unwilling to accept the criteria of truth-value set up by the traditional metaphysician and for the same reason that the neo-positivist employs in rejecting all metaphysics; while at the same time actual idealism sides with the traditional metaphysician in pointing out to the neo-positivist that his interpretation of the cosmos is no more secure epistemologically than any of the systematic interpretations of the real made by metaphysicians. The advantage of actual idealism, as the present author sees it, is that whereas the traditional metaphysician and the neo-positivist make assumptions on two levels, first as to the nature of philosophic inquiry and second as to the nature of the real or the cosmos, actual idealism by its immanentism is required to make assumptions only on the first level. Gentile does not himself make this distinction in the *Sistema*. He argues his freedom from assumptions on the second level, without realizing that all philosophy in its initial stage is subject to the logocentric predicament and hence to bare assumptions. But he is quite correct in arguing that by taking a third path the metaphysician can avoid the prejudices of traditional metaphysics and still remain a metaphysician. An understanding of actual idealism involves an understanding of the essential difference to the thinker between assumptions as to the nature of philosophy (first level) and assumptions as to that which transcends thinking (second level). The first are, by the nature of thought, unavoidable; the second are not.

Actual idealism gains certain advantages, but what does it lose in its unwillingness to accept assumptions on the second level? What, in the first place, of the specific and independent shocks and intrusions upon thought on which the critical realist lays so much emphasis? It may be agreed that the findings of physics with regard to the gravitational effect of one body on another are not a part of the material of the philosopher's workshop. Nevertheless it ought to be a part of that workshop's raw material that the gravitational effect of one body on another is what it is and waits to be discovered by the physicist in a sense in which it is not entirely possible to say that the law of gravity is created by the physicist. He may create the law *as a law*, but he certainly does not create the fact that $1/d^2$ is a more accurate description of the law

than $1/d^3$. Actual idealism is impotent to take account of this most convincing of human experiences. It gains more fundamental criteria of truth-value than had previously been known; but it must reject a philosophic knowledge of the cosmos. It does not reject the cosmos, as has often been charged. Obviously it could not. Its position is as tenable as those it would supersede; but it will not be received sympathetically as long as men are more concerned with external events than with *pensiero pensante.*

It is objected, secondly, even by Benedetto Croce, that the immanentism which is boasted as a strength is the greatest weakness of actual idealism. It seems to open the way to every kind of impulsive and irrational judgment in the name of truth. Is whatever a man may think, or want to think, true? Is it not rather the virtue of philosophy that it fosters unimpassioned and impersonal intellection according to the rules of reason? But intellection according to the rules of reason is thinking in a circle wherein one arrives just where one started. Gentile has brought to its most fundamental application, in the field of logic, a principle first recognized and respected by Plato in ethics in spite of his ridicule of Protagoras' relativism of sensation. Plato contended that no man desires to act toward evil rather than good. Nor did Plato stop there. He even argued, upon occasion, that no man desires to think the false rather than the true. But neither he nor Epictetus, who remembered these arguments and approved them, saw the full application of the principle to an interpretation of knowledge and reality. They were too busy thinking in terms of transcendental metaphysical systems. Just as every man's actions are good to himself, so every man's thinking is true to himself. Man is the measure of all things, even of the most fundamental of all things, his own thinking. This realization is the backbone of Gentile's philosophy, just as Plato's is the backbone of his ethics. Whatever a man thinks he thinks as true—and there still remains the possibility of distinguishing truth from opinion. For any one thinker the judgments of others are opinions if they cannot be fitted into the structure of his philosophy and hence prefaced by him with the all-important 'I think'.

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IN THIS paper I propose to consider propositions of a special sub-class of propositions, with a view to determining as precisely as possible their logical as well as their epistemological status. The kind of propositions I have in mind are such as are usually associated with so-called Judgments of Perception, in which descriptive complexes involving sense-data items are believed, or disbelieved, to apply uniquely to particular physical objects. A proposition belonging to this class, which is a proper subset of the class of propositions involving Definite Descriptions,[1] will be, for example, the proposition 'This sheet of paper is white', the logical form of which, expressed in the symbolism of modern logic, would be explicitly exhibited by the following expression [$f(x)$ = x is a sheet of paper; $g(x)$ = x is white; this (standing for a sense-datum) = a; R (a, x) = a is a manifestation of x, where 'manifestation of' may have any of a variety of meanings, including 'surface of']:

$$(\exists x):R(a,x):(y)\cdot R(a,y)\supset(y=x):f(x)\cdot g(x),$$

to the effect that there exists one and only one x of which a is a manifestation, and that x is both a sheet of paper and white.

So far as I am aware, no philosophers, with the exception of a group of realists, hold views from which it follows that physical objects are ever directly presented to our apprehension, or that we ever could have knowledge by acquaintance of the 'external world'. It is clear enough that any such view would be a mistaken one. For it would also have to follow from it that we could never be in error when judging that perceived sense-data are manifestations of certain things in the external world; whereas all philosophers must take it to be a commonsense *fact* that we *do* often pronounce false judgments of perception.

Some philosophers, however, who hold no direct-apprehension view regarding physical objects, yet insist, if I understand them rightly, that we can and often do *know* that such objects as buildings and trees and other persons exist. I am not entirely clear as to what precisely these philosophers intend us to understand by the

[1] For convenience I shall henceforth give the designation 'Definite Descriptions' to such propositions.

word 'knowledge', as they use it when designating cognitive experiences which consist in the apprehension, in some sense, of objects ordinarily thought of as *transcending* immediate experience. They seem to use it in such a way that though we could not be said to stand in the relation of direct mental *contact* with physical objects we yet could be said to *know* them (in the sense of knowing that they exist). In this regard, they make a distinction between two connected meanings of the term 'knowledge'; namely, between knowledge as *direct* and knowledge as *indirect*, which, I take it, correspond respectively to those meanings to which Russell has assigned the expressions 'knowledge by acquaintance' and 'knowledge by description'. It is in the latter sense, *i.e.* in the sense in which we are said to know objects indirectly or descriptively, that the word 'knowledge' is used by them to designate cognitive cases in which we apprehend teacups and stars. On their view, then, many, if not all, so-called judgments of perception will constitute cases of indirect, or descriptive, knowledge.

The meaning of 'indirect knowledge' is not altogether clear; and in attempting to determine precisely its meaning, it will be best to consider it in connection with the meaning of direct 'knowledge' or 'acquaintance'. It is not, I think, difficult to ascertain precisely the meaning of the latter. According to Russell, "We shall say that we have acquaintance with anything of which we are directly aware, without the intermediary of any process of inference or of any knowledge of truths".[2] This is to say that we have knowledge by acquaintance that p, *e.g.* 'This is a pain' or 'This sense-datum is red', when and only when p's truth-value is directly presented to us with p, as a factor in it. In such a case we could ascertain p's truth-status, or p's factual-status, should p be a fact, by an inspection of p *alone*, and could thus be said to have acquaintance with its truth- or factual-status without the need either of inferring from, or of having acquaintance with, other 'truths'. The meaning of 'knowledge' in this usage is obvious. It means, at least in part, *cognitive indubitability*, such that anyone directly knowing that p could entertain no *rational doubt* that p.

In the case of indirect, or descriptive, knowledge, an object

[2] B. Russell, *The Problems of Philosophy* 73.

known is not directly presented to the mind apprehending it. A *description* p of the object, *e.g.*, a table, *intervenes* between the mind and the table, where p stands in the relation of acquaintance to the mind and the table does not stand in such a relation to it, but is known, supposedly, by it through the intermediation of p; *i.e.*, the table stands in the indirect relation of being known *through* p. "There is no state of mind in which we are directly aware of the table; all our knowledge of the table is really knowledge of *truths*, and the actual thing which is the table is not, strictly speaking, known to us at all. We know a description, and we know that there is just one object to which this description applies, though the object itself is not directly known to us. In such a case, we say that our knowledge of the object is knowledge by description."[3] This kind of knowledge is supposed to "enable us to pass beyond the limits of our private experience. In spite of the fact that we can only know truths which are wholly composed of terms which we have experienced in acquaintance, we can yet have knowledge by description of things which we have never experienced."[4] Accordingly, it is held that we can have either of *two kinds* of knowledge of empirical facts: "Understanding, then, that by 'know' I mean 'have actualized knowledge of', I hold that at different moments in our lives we know a great many empirical facts. And I also hold that in a certain sense we know a great many of these facts *directly*, and a great many only *indirectly*. I should say that at most moments of our waking lives we are both knowing a good many empirical facts directly and a good many indirectly."[5]

From this we can, I think, discern clearly the meaning of 'knowledge' as it is used in conjunction with 'indirect'. It is to be noted, for one thing, that cases of *both* kinds of apprehension, *e.g.*, cases in which we apprehend sense-data and cases in which we are aware of chairs, are designated by the same word, *knowledge;* so that though our apprehension of a chair, when we know it indirectly, would differ in important respects from that in which we apprehend a sense-datum, we should in both cases be said to *know* the objects in question. And it is to be supposed that by 'knowing' they mean in each instance precisely the *same* thing, at

[3] B. Russell, *op. cit.* 74-75. [4] B. Russell, *op. cit.* 92.
[5] G. E. Moore, "Indirect Knowledge", *Proc. Artist. Soc.*, Suppl. IX, 23.

least generically, even though indirect knowing would be different in some respects from direct knowing.

It thus seems that they are using 'knowledge' univocally to mean one and the same thing, of which *indirect* and *direct* are *two forms*, or *species;* and therefore that at least part of what they must mean by it is *rational indubitability* of apprehension, such that anyone knowing an object α, whether directly or indirectly, could not possibly doubt, or be mistaken about, the existence of α. This meaning accords with the usual meaning of 'knowledge' in the English language, in which 'S *falsely* knows (either directly or indirectly) that p' is self-contradictory. " 'S knows that p, and p' or 'S perceives that p, and p' do express tautologies; and 'S knows that p, but not–p' or 'S perceives that p, but not–p' do express contradictions."[6] That this *is* their usage of 'knowledge' in the phrase, 'indirect knowledge', is substantiated by their insistence that our apprehension of physical objects is neither one of belief nor of knowledge of the probability that there exist certain empirical facts not directly given: "But do I really *know* all the propositions in (1) to be true? Isn't it possible that I merely believe them or know them to be highly probable? In answer to this question I think I have nothing better to say than that it seems to me that I *do* know them with certainty."[7]

In this sense of 'knowledge' it is quite clear that indirect knowledge is distinct from and incompatible with *true belief*, though it is very easy to confuse them. From a fact of the form 'S believes *truly* that p' it follows strictly that p. For this reason it might be thought that such a fact would be equivalent to a fact of the form 'S knows that p', where p is a true description of a transcendent empirical fact; since from a fact of the latter kind it also follows strictly that p. But it must be observed that belief is *intrinsically fallible*,[8] such that S himself could *not know*, at the time he does in point of fact believe truly, that he does believe truly. This is to say, from a *fact* of the form 'S believes truly that p' it does follow

[6] G. E. Moore, "Facts and Propositions", *Proc. Artist. Soc.*, Suppl. VII, 194.

[7] G. E. Moore, "A Defense of Common Sense", *Contemp. British Phil.*, 206.

[8] G. E. Moore, "Facts and Propositions", *Proc. Artist. Soc.*, Suppl. VII, 194.

that p, but it does *not* follow that 'S *knows the fact* that he truly believes that p'; because such a fact would be a fact *about* and one *extrinsic to* S's judgment, the fallible nature of which would *preclude* his knowing that fact at the time he was holding his belief.

That we often have true beliefs about transcendent empirical facts is hardly to be doubted. It is also clear that indirect knowledge of *some* facts can be and sometimes is had. At present, for example, I know that there exists a number satisfying the properties of being prime, being greater than 53, and being a divisor of $(53! + 1)$; that is, I *know,* without the possibility of entertaining any rational doubt whatever, that there exists a value of p, such that $p > 53$, $pn = 53! + 1$, $n \geqq 1$. But, at the same time, I have no acquaintance with that number. I only know some of its properties and the *fact* that it exists. But my apprehension of it clearly constitutes an instance of knowing, although it is indirect, being 'based' on my direct knowledge of 'truths', or, more accurately, on *a priori* facts. It is based on my direct knowledge of the following facts: that no two successive natural numbers, both greater than 0, can have any divisors but 1 in common, and that this is the case in regard to such pairs of numbers as 53 and $53! + 1$; that 53 is a prime number; that, therefore, if $53! + 1$ contains any prime divisors greater than 1, they must be distinct from 53 or from any number less then 53 and greater than 1; and finally, that either $53! + 1$ contains a prime divisor greater than 53 or else that $53! + 1$ is itself the required prime. On my knowledge of these facts is *based* my knowledge that there necessarily exists a number satisfying the above properties, *i.e.*, that the proposition

$$(\exists p,n)\cdot(p>53)\cdot(pn=53!+1)\cdot(n\geqq 1)^{9}$$

describes an actual number. It is to be noted that this proposition is *necessarily* true, certifiable on logical grounds, *a priori,* since it is entailed exclusively by facts belonging to the domain of the *a priori:*

$$\sim\Diamond\sim(\exists p,n)\cdot(p>53)\cdot(pn=53!+1)\cdot(n\geqq 1).$$

Stated in general terms, this means that I know certain generic properties of numbers, and with regard to them, by *pure reason alone,* I can obtain direct knowledge of 'truths' or facts (*e.g.*, that

[9] p denotes prime numbers only.

there exists an infinite number of prime numbers) which give me the knowledge that facts satisfying certain properties exist, without my having acquaintance with those facts.

The possibility of having indirect knowledge in the domain of the *a priori* is, thus, clear. But whether indirect knowledge can be had in the realm of *empirical* facts is very questionable. I shall attempt to show that this question must be answered in the negative, by demonstrating that the logical status of the only kind of propositions which apparently enable us to have knowledge of transcendent empirical facts is such that they could not possibly give rise to such knowledge.

We are told that our knowledge of empirical facts transcending our immediate awareness obtains from our direct knowledge of 'truths' about those facts. Obviously, if we are to have indirect knowledge of empirical facts we must know 'truths', in some sense, about those facts, since such transcendent facts could only be known, if they can be known at all, through the intermediation of truths, not 'falsehoods', about them. I am not certain, however, what precisely is to be understood by 'truths'. It is clear, for one thing, that they must be *propositions* of some sort, because propositions alone are supposed to be capable of being true, or of being 'truths'. And the question I propose to raise in this connection is whether such propositions are to be taken as *a priori* or as *contingent* truths.

The point I am here raising has never, so far as I am aware, been explicitly considered by those philosophers who hold that we can, and often do, possess indirect knowledge of empirical facts. My remarks in regard to what they could possibly mean by knowledge of 'truths' about transcendent empirical facts are not based on any arguments they present in favor of their position. So far as I am aware they offer no arguments in support of their theory, but simply assert it to be true. Thus Professor Moore says, in regard to certain propositions concerning transcendent empirical facts: ". . . it seems to me that I do know them with certainty." This of course is no demonstration; it does not arise out of the *analysis* of indirect knowledge. Moreover it is a flatly self-contradictory statement, unless by 'know' he means 'dispositionally know', which it is to be supposed he does not mean. It is to be

supposed that he is talking about 'actualized knowledge', *i.e.*, the propositions which he claims *actually* to know, with absolute certainty. And if by 'know' he does mean 'has actual knowledge', then he flatly contradicts himself, as the following consideration shows. From a fact of the kind (a) 'It *seems* to S that he knows that p' it does not follow that p, but it does follow that 'S *could* rationally doubt that p' (since he could rationally doubt that he knows that p); while from a fact of the form (b) 'S knows that p' it not only follows that p but also that 'S could *not* rationally doubt that p'. Professor Moore's statement, which combines (a) and (b), is thus conceptually non-significant, because from the conjunction (a) and (b) it follows that 'S both *could* and *could not* rationally doubt that p'.

To revert to the question regarding what is to be understood by 'truths'. From examples these philosophers have used to illustrate their theory it is to be gathered that by 'truths' they mean contingent propositions that are true. Stebbing, however, sometimes speaks as if the problem of indirect knowledge of empirical facts is a problem of *analysing facts* of which we have knowledge: "Accordingly, in my view, 'the problem of the external world' is not a problem of justifying an inference, or a belief; it is a problem of *analysing* what we know when we do know such facts."[10] On the surface, this seems to be a very queer enunciation, because, if I am not mistaken, she seems to be saying that we can analyse transcendent facts, *i.e.*, *facts not directly given to our awareness.* How it is possible to *analyse* things not directly given to us she does not make clear. It would seem to be downright nonsense, *unless* she means to say that what we *actually* analyse are *propositions about* facts of the external world, which if they did truly describe empirical facts would result in our obtaining analyses *equivalent to* the analyses we would obtain if we were directly to analyse those facts. If *this* is what she means, then she intends to say that the problem of our knowledge of the external world is "a problem of analysing what we know *directly* when what we know directly gives us or enables us to have indirect knowledge of transcendent empirical facts". But she does not seem to mean this, for she also asserts that "*This table* is given when I am in fact

[10] L. S. Stebbing, "Constructions", *Proc. Artist. Soc.* XXXIV, 27.

perceiving the table along with the sense-datum of which I can, by an effort, become immediately aware".[11] She is apparently asserting that the table is given, not through the intermediation of sense-data, but *along with* them; in spite of the fact that it must be supposed, if error is to be accounted for, that physical objects are not given *along with* the sense-data attributed to them, but rather that they *give rise* to sense-data and are apprehended or given *through* their sensory manifestations. And Stebbing seems to contradict herself on this point. She maintains the correctness of the "Principle of Reducibility to Acquaintance", namely that "Every proposition which we can understand must be composed wholly of constituents with which we are acquainted".[12] But she also seems to hold that the word 'this', in such a sentence as 'This table is massive', is used *demonstratively*, to designate what is *given along with* sense-data, *i.e.*, the table. Thus it would follow, according to the "Principle of Reducibility to Acquaintance", that in having acquaintance with such a proposition as 'This table is massive', which she holds we can have, we should have *acquaintance* with the object 'this' is designed to stand for, *i.e.*, the table. This stands in obvious contradiction to a further statement she makes: "But it is abundantly clear that *the table* is not a possible object of acquaintance to either gods or men."[13]

It should be obvious now how difficult it is to formulate precisely the view under consideration. I think, however, that the question I am raising regarding what is to be understood by 'truths' is highly pertinent to this view. It seems to me that by 'truths' the exponents of this view must mean either *a priori*, or analytic, truths, or else contingent propositions that are true. Now if it can be shown that the apprehension of *neither* kind of truths can give us indirect knowledge of the external world, it will be clear that this view is untenable.

It is not difficult to see that *a priori*, or analytic, propositions could not possibly be meant. Stebbing, however, seems to think that we can have *analytic* knowledge of matters of transcendent empirical fact, *i.e.*, knowledge of such fact obtained analytically. By this I take it she means, that from an analysis of *a priori* propo-

[11] L. S. Stebbing, *op. cit.* 27.
[12] L. S. Stebbing, *op. cit.* 25
[13] L. S. Stebbing, *op. cit.* 20.

sitions such knowledge can be obtained. For it is difficult to see how an anlysis of *contingent* propositions (which I will show cannot be known to be true without our having a logically prior acquaintance with the facts making them true) could lead to such *knowledge*. Let us suppose, then, that by 'truths' is to be understood *a priori* truths, such that if we had knowledge by acquaintance of them we could also derive from them indirect knowledge of certain empirical facts. Is this a significant supposition?

One thing implied by such a view is that by pure reason alone it is possible, by analysing such directly presented propositions, to obtain knowledge of transcendent empirical facts. Of course, the obtained knowledge of such facts will be indirect; and this will entail the direct knowledge of a truth (true description) or set of truths about those facts. From a fact of the form 'S indirectly knows α' it follows that 'S directly knows that p', where p is a proposition truly describing α; *i.e.*, indirect knowledge of a fact entails acquaintance with a description of it. Such obtained truths will, plainly, have to be *contingent*, because they will be descriptions of *empirical* facts. Their truth-values will be determined *solely* by the existence or non-existence of the kinds of facts which they describe and to which they refer. Hence, on this supposition, we could analytically derive contingent truths from *a priori* truths. This I think is self-contradictory.

According to this hypothesis, direct knowledge that p (where p is a contingent truth to the effect that there exists a transcendent empirical fact of a certain kind described by the proposition p) obtains from or is 'based on' direct knowledge of a set of *a priori* truths φ, such that from a fact of the form 'S directly knows that φ' it follows that S could, from an analysis of φ, directly know that p. This implies that φ *entails* the contingent truth p; otherwise our knowledge that p could not be based on, or be analytically derived from, our knowledge that φ. Now it will be generally admitted that nothing can be both *a priori* and contingent, or, what is tantamount to this, that nothing can be both intrinsically certifiable and not intrinsically certifiable. It will also be admitted that all the consequences of an *a priori* truth must themselves be *a priori*. These are strictly logical dicta, a violation of which must result in logical contradiction. In consistency with these prin-

ciples, therefore, it would have to be held, in regard to this view: either (1), if p is supposed entailed by φ, that p is *not* contingent, whereas p *must* be contingent if it is to be a description of an empirical fact; or else (2) that p is contingent, but is not entailed by φ. In the latter case, which is the only possible one, our knowledge that p could not be based on our knowledge that φ. Consequently it is impossible that our knowledge of transcendent empirical fact be based on, or be analytically obtainable from, our knowledge of *a priori* truths.

It is patent, therefore, that by 'truths' can only be meant *contingent* propositions that are true. Furthermore it is clear that given a set of contingent truths it is possible, from the conjunction of any of the set, to derive analytically a good many further contingent truths. This is a well known fact in Postulate Theory. Hence, if we could *know* certain contingent truths we could, if we desired, derive explicit knowledge of a good many further truths entailed by the truths with which we have acquaintance. To illustrate, if I *knew* that this was a sheet of paper, I could also know that there was another side of it which I was not seeing. Thus from my knowledge that p (p = this is a sheet of paper) I could obtain knowledge that q (q = there is a side of this sheet of paper which I am not seeing), where q would be a contingent truth describing a transcendent empirical fact, *viz.*, the other side of this sheet of paper.

Can we, however, possibly have direct knowledge of contingent *truths* describing transcendent empirical facts?

I do not mean to suggest by this question that we cannot have acquaintance with contingent truths. We obviously can and often do have such acquaintance. But we must distinguish here between being acquainted with a (true) proposition, in the sense of knowing what we are expressing when we use words to express a proposition, and being acquainted with the *truth-value* of the proposition, *i.e.*, *knowing* the proposition, with which we have acquaintance, *to be true*. The first, at most, entails having acquaintance with all the factors *intrinsic* to the proposition; the second entails having acquaintance with a further fact *about*, and *not an item in*, the proposition, namely the fact that it is true. An instance of the first kind of knowledge would be expressed by the words

'S has acquaintance with p', while an instance of the second kind would be expressed by the words 'S knows *that* p', where the latter would entail the former, but not conversely. From a fact of the first kind, *e.g.*, S has acquaintance with the proposition 'There are ghosts', a fact of the second kind would never follow, *e.g.*, S knows that there are ghosts, since the latter would entail there being ghosts, while the former would not. This is an obvious distinction which must be made. We certainly can know contingent truths in the first sense. But can we also know them in the second sense? This is my question: Can we *know* that the contingent truths (about transcendent empirical facts) with which we have acquaintance *are* truths?

One point regarding contingent propositions has been made clear by the Cambridge group of philosophers, and especially by Russell in his Theory of Descriptions. This is that the truth-value of a contingent proposition is *not analytically certifiable, i.e.*, an analysis of a contingent proposition alone will not disclose its truth-value. Thus Russell says: "Whenever the grammatical subject of a proposition can be supposed not to exist without rendering the proposition meaningless, it is plain that the grammatical subject is not a proper name, *i.e.*, not a name directly representing some object."[14] A direct consequence of this principle is that whenever the apparent subject of a proposition, *e.g.*, 'this table' in the proposition 'This table is massive', stands for no actual fact existing *in* the proposition, as its subject, it cannot be analytically determined, *within* the proposition, whether or not the proposition truly describes anything, that is, whether or not it has an ultimate subject to which it uniquely refers. This is often expressed in the form 'Every contingent proposition has a genuine contradictory'. If the above proposition is expressed in logical notation this becomes clear [$R(a, x) = a$ is a manifestation of x; $f(x) = x$ is a table; $g(x) = x$ is massive]:

$$(\exists x).(y): R(a,x): R(a,y) \supset (x=y): f(x).g(x).$$

If this is correct (as it certainly is), it follows that *no* contingent proposition about transcendent empirical fact is *intrinsically certifiable* to be true, or false. Otherwise, if it were intrinsically certi-

[14] Russell and Whitehead, *Principia Mathematica* I 66.

fiable, it could have no actual contradictory; because its truth-value would then have to be intrinsic to it, which consequently would not allow its having a genuine negative. The truth-values of contingent propositions are determined *solely* by circumstances *external* to the propositions. And the actual facts in the external world making certain propositions true are the transcendent facts to which those propositions *refer*. Hence it is entirely impossible to ascertain, by an analysis of a given contingent proposition itself, the truth-value of the proposition; and so it is impossible to know, from an analytic inspection of it, whether or not it is true, *i.e.*, whether or not it describes a transcendent empirical fact. In order to *know* the truth-value of a contingent proposition, or to *know* that a contingent truth *is* a truth, we should obviously have to be *acquainted* with the fact which renders it true. Otherwise it would seem absolutely impossible to *know* it to be true.

This must be so; for since we cannot know a contingent truth to be true from an analysis of it, we must obtain that knowledge non-analytically, *i.e.*, by acquiring direct knowledge of the fact making it true. But this makes impossible the supposition that contingent truths can *give* us indirect knowledge of transcendent empirical facts, because our knowledge that such truths *are* truths entails our having *acquaintance* with the empirical facts of which knowledge of the truths was supposed to enable us to have *indirect* knowledge *only*. Without having acquaintance with the facts from which it follows that the contingent propositions we apprehend are true we could never, possibly, know the propositions to be truths. And since these philosophers do hold, for very good reasons, that we cannot have acquaintance with such objects as carpets and cigarettes, they cannot also hold, without contradicting themselves, that we can know the truth-values of propositions whose "apparent subjects" transcend our immediate experience. They cannot, thus, hold that we can have indirect knowledge of matters of transcendent empirical fact. This is to say that to hold, as they *do* hold, that contingent truths are not intrinsically certifiable is *inconsistent* with also holding that we can have knowledge of their truth-values *without* having direct knowledge of the facts making them true. Consequently it is inconsistent with holding that we can have indirect knowledge of transcendent empirical fact.

Stebbing asserts that *"givenness* is not equivalent to directness",[15] and holds, further, that physical objects can be *given indirectly* to our apprehension. She is no doubt correct about the usage of the terms 'givenness' and 'directness'. But she also maintains, with regard to this distinction, that when physical objects are so given to our awareness we can *know* those objects to exist; though she nowhere makes clear *how* we can know that an object, which is in point of fact indirectly given to us, *is* given to us. Nor does she attempt to offer a criterion which would enable us to distinguish between propositions which, when apprehended, would result in our obtaining *knowledge* of transcendent empirical facts, and propositions which, when apprehended, would result only in our holding *beliefs,* or in our drawing inferences, that there do exist such facts. That is, she offers no criterion in accordance with which we could distinguish intrinsically between contingent truths and contingent falsehoods. An attempt to formulate such a principle must, obviously, end in failure.

It is certain to be admitted by everyone that nothing can be *given,* in any sense whatever of 'given', except as there exists something to be given. *Givenness entails existence.* It follows, therefore, that anything given, either directly or indirectly, exists. But it does *not* follow from this that when an object is given indirectly, through a description, the person to whom it is so given *knows* that the object, to which the description applies, exists. From a fact of the form 'S indirectly apprehends α', or 'α is indirectly given to S', it does follow that α exists; and from a fact of the form 'S has acquaintance with the true proposition p', where p is a definite description of the transcendent empirical fact α, it follows that there exists something, α, which is indirectly given to S, through p. But it does not follow from either of two such equivalent facts that 'S *knows* p to be true', or that 'S *knows* that α is indirectly given to him, through p'. It does follow from a cognitive act in which something is indirectly apprehended that there *is* something which is indirectly apprehended; but it does *not* follow that a person having such a cognitive experience has the *further* cognitive experience of *knowing* that he is apprehending something indirectly given to him. This is a very easy confusion to

[15] L. S. Stebbing, *op. cit.* 27.

make, because from facts of *both* kinds, 'S indirectly apprehends α' and 'S knows that he indirectly apprehends α', it follows that α exists.

Propositions about matters of transcendent empirical facts commonly associated with judgments of perception, must then be logically classified with those propositions whose truth-values are not intrinsically certifiable; *i.e.*, they must, logically, be classified as contingent propositions. Their epistemological status, consequently, must be such that they cannot enable us to have, or to obtain, indirect *knowledge* of the facts to which they refer, if they do refer to actual facts; *i.e.*, they cannot be known by us to be truths without our having a logically prior acquaintance with the facts making them truths.

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DISCUSSION

THE MEANING OF 'GOOD'

THE problem of the definition of 'goodness' and 'the good' connects the abstract issues of *Wissenschaftslogik* with the heart of the sciences of value. I have touched upon it in some reflections already published as "The Definition of Yellow and of Good"[1] and "Ethics as Pure Postulate".[2] I wish in these pages to revise my previous conclusions in the light of recent discussions of meaning and definition. I shall attempt first to explain the complex implications and the antecedent improbability of the suggestion that 'good' is indefinable, and, second, to state what actually is the definition of 'good'. For this inquiry, we shall need to differentiate between good and the good, but not between good and goodness.

A definition is the device by which a person signifies to another or records for himself how a word or other symbol is employed; that is, what are the characters or properties in a thing which are necessary and sufficient for the application of the word to the thing. These characters are the defining characters of the word. An ordinary descriptive definition states how a word is employed in common usage. A prescriptive definition postulates how a word shall be employed in a certain context or system. The function of a definition is fulfilled if understanding is achieved. This function is the defining character of 'a definition'.

Since a definition is always of a word or of words, or other symbols, it is idle to talk of indefinable *qualities:* for instance, the indefinability of goodness. Except in a very strained and confusing sense, not things and qualities but their *names* are defined.

Since the sole essential nature of a definition of a word is that it conveys information about how the word is used, and since no word can have become part of a conventional language unless persons are able to agree upon and communicate concerning its application, it is idle to talk of the indefinability, in any strict sense, of a familiar word such as 'goodness'. All words are definable.

Philosophers, therefore, who have doubted the definability of goodness, must have meant the definability of the word 'goodness', and they must have meant definability in some more narrow sense than ours. G. E. Moore, indeed, made plain that he did mean definability in a more narrow sense, that is, he meant definability by analysis.[3] An analytic definition is one which conveys the meaning of a word by means of other words, already familiar to the hearer, which signify

[1] *Journal of Philosophy* XXVII (1930) 515-527.
[2] *Philosophical Review* XLII (1933) 399-411.
[3] *Principia Ethica* 8.

singly the constituents of the defining character of the word. If the defining character has no distinguishable constituents, the word cannot be analytically defined. Moore has confessed that his classic argument for the analytic indefinability of 'good' was "certainly fallacious"; but he still thinks its conclusion "very likely" true,[4] and there apparently are other moral philosophers who agree with him. If goodness is unanalysable, axiology must content itself with remarking what characters are customarily conjoined with goodness, *i.e.*, what kind of things, or things in what kind of context, are good, or, in a familiar terminology, are goods; or, as Broad has it, what qualities are good-making.[5] I believe, with Field,[6] that this might be a more significant scientific achievement than is sometimes supposed; but it would not be a definition of 'good'.

In order that we may appreciate what is involved in the suggestion that goodness may be unanalysable, it is essential to remark in just what consists the analysability of an undisputedly complex character. Experience contains some characters, such as yellowness, which are in some sense phenomenally simple, as well as other characters, such as triangularity, which are in the corresponding sense phenomenally complex. A triangle may be analytically described as a plane closed rectilinear figure with three sides and three angles. But, as a matter of fact, most persons actually recognize the proper occasions for the application of the word 'triangular' by a massed effect, a gestalt-quality, without ever having verbally formulated or being cognitively aware of the single details of this elaborate constitution. As Ducasse has it, they know the meaning of 'triangularity' intuitively but not discursively.[7] In so far as the name for an experienced complex is used to mean primarily the gestalt-quality of the whole as a whole, and in so far as a whole is more or other than the sum of the constituents named by its analytic description, then if the aim of analysis is to assert a complete identity of the analysed and the elements of the analysis, just so far is all analysis by hypothesis impossible. Some strictures on 'the naturalistic fallacy' thus argue in a fashion which would prove the unanalysability not specifically of goodness but of

[4] "Is Goodness a Quality?" *Aristotelian Society, Proceedings,* Supplementary Volume XI (1932) 127.

[5] C. D. Broad, "Is 'Goodness' a Name of a Simple Non-Natural Quality?" *Aristotelian Society, Proceedings,* n. s. XXXIV (1933-34) 263.

[6] G. C. Field, "The Place of Definition in Ethics", *Aristotelian Society, Proceedings,* n. s. XXXII (1931-32) 93.

[7] C. J. Ducasse, "Is Scientific Verification Possible in Philosophy?" *Philosophy of Science* II (1935) 123. This contrast is considered, with special reference to the definability of "good", by G. C. Field, *op. cit.* 81., and by C. D. Broad, *op. cit.* 254-255. It is of fundamental importance for all the philosophical disciplines. Cf. my "Analysis, Analytic Propositions, and Real Definitions," *Analysis* III (1936) 75-80, where I excogitate some technical issues of the present discussion.

everything. Since neither party to the present discussion intends such a denouement, let us expressly postulate that when we ask if goodness is analysable we mean analysable in the sense in which triangularity *is* analysable.

The assumption that goodness shall turn out to be unanalysable involves, then, first of all, the assumption that it is not obviously complex, like triangularity, but at least apparently simple, like yellow. *A priori*, this assumption has much less than an even chance of being true; first, because even in immediate experience obviously complex characters are much more numerous than apparently simple ones; and, second, because many of the characters connoted by the words of our language are characters which do not occur in experience at all, but are imputed to parts of the physical world beyond experience. All characters which are both unexperienced and imputed to physical nature *must* be complex (because we cannot meaningfully impute an unexperienced simple character), and all characters ordinarily imputed to the physical world at all *are*, as a matter of fact, complex (on the scientific principle that physical nature is without limit analysable.)

The assumption that goodness shall turn out unanalysable involves, in the next place, the assumption that an apparently simple quality, like yellow, really *is* simple. Since the ingredients of the physical world are by hypothesis analysable, this involves first the assumption that the quality in question does not belong to the physical world, which, in turn, involves either the dualistic assumption that there is an ultimate bifurcation of being, or the phenomenalistic assumption that there is no physical world. And it involves second the assumption that a quality which cannot be analysed into physical units cannot be analysed at all (into psychic atoms, for example).

But we are not even yet at the end of the road. For if goodness is like yellow it will be at any rate consistently correlated with certain kinds of physical structure, and it will be analysable vicariously by the analysis of these intimately necessary and sufficient conditions. Such analysis could serve virtually every scientific purpose. Indeed, any science which began by being interested in the quality would end by being interested only in the correlated structure, and in less time than that during which philosophers have debated concerning goodness would transfer to the structure the name which was originally the name of the quality. If the assertion of the unanalysability of goodness is not to be wholly empty and academic, goodness must be not even correlated with analysable structures, and the world must be in this regard fundamentally irrational and sporadic.

The proposition that goodness is unanalysable requires, therefore, a conjunction of assumptions whose very number renders it ante-

cedently very improbable, and some of which render it still more improbable by contradicting empirical evidence and fundamental postulates of scientific thought. Antecedently most likely, on the other hand, because it requires fewer special assumptions and is in closer accord both with experience and with scientific postulates, is the supposition that the word 'goodness' connotes a complex kind of structure in the world of natural fact. I think that just this supposition coincides with —as the positivists say—what is the case.

What *is* the definition of goodness? To the unsophisticated, the question does not appear especially recondite. The scientific philosopher, whenever he can, will resort to the conclusions of the empirical expert with regard to matters of fact. With respect to the definition of words, the scientific authority is—the dictionary. One feels a little foolish to suggest it, but ought not the lexicographer to know the facts about the real meaning of 'goodness' exactly as the physicist knows them about the real nature of matter? By careful observation of common speech, by comparison of centuries of literary modes, and by research into linguistic origins, disinterested scholars have determined as precisely as possible what is the defining character of the word 'good', that is, what has been the necessary and sufficient occasion for its application. The statement of their results is analytic and naturalistic, and, I think, more illuminating than many volumes of rational axiology.

The original meaning of 'good' is *fit* or *suitable:* that is, good for. From this statement, the lexicographers develop, for their special practical purposes, their catalog of divergent and derivative uses. But if one brings to bear a modicum of philosophical and psychological technique upon the several columns which the *Century Dictionary,* for instance, devotes to 'good', certain pretty decisive conclusions will emerge for him. My own reading of the evidence is as follows.

There are causal conditions in the world such that a given effect is achieved by one sort of thing and not by others. Among living creatures, at least, there are purposes—conative directions, desires, interests—which are satisfied by some sorts of things and not by others. Now, although it is unlikely that either the men who thousands of years ago originated the word 'good' or the men who employ it today have been discursively conscious of the principle of their usage, 'good' has been consistently elicited by the presence of things either of the sort which satisfied, or were believed able to satisfy, the conative direction of the speaker, or of a sort capable of effects of the sort which would satisfy it. Both the purposive and the causal component are usually present in the meaning of 'good'. As speech and reflection have become refined, the distinction is clarified between 'end-value'

or 'goodness in itself' and 'means-value' or 'goodness-for'. Technical usage, including our usage for the rest of this essay, is concerned almost exclusively with the former concept. The determination of means-values is a task for common sense and the sciences. On the other hand, the causal component of the meaning of 'good' still survives in common speech, and may even be isolated from the purposive component, causing bewilderment by such verbal anomalies as 'green fruit is good for indigestion'.

The word 'good' has a kind of polite and intersubjective currency to connote conformity with just anybody's purposes, and especially with conventional, public, or average purposes. But I believe, on grounds introspective, historical, and metaphysical, that a man utters the word with genuine intent and conviction only to denominate what comports with *his* purposes. He uses it as an epithet expressing *his* approval. The philosopher can systematize and refine this usage, and trace its consequences; but no amount of high thinking or pure living can induce men to have meant something else. I may, of course, be mistaken in my interpretation of the lexicographer's results, and (although this is very improbable) the lexicographer may be mistaken about how people have used 'good'. These are inevitable uncertainties of discourse. On the other hand, moral philosophers may have meant by 'good' some other character than that which the rest of humanity mean. In the last case, although it would be interesting to ascertain what character they have been speaking of, and why they wished to speak of it, they were by hypothesis speaking of something other than *goodness*, and their conclusions do not here concern us.

An acceptance of the dictionary definition of 'goodness' would dispose incontinently, of course, of the claim that goodness is ultimate, simple, and non-natural. But no reasonable man would rely on so naïve and easy a *tour de force* unless he found it capable of assisting with the real problems of the theory of value. With the analytic definition of 'goodness' in our hands, we are in a position profitably to pursue the subject by seeking the deeper analysis of the constituents of goodness, especially of purpose, or by asking what, as a matter of fact, does fundamentally conform to our purposes. The first pursuit would doubtless contribute to the success of the second. It is the second, I think, which ethicists have customarily engaged in, often without clearly differentiating it either from the definition of 'goodness' or from the determination of the causal conditions of what is good. Theoretically, as R. B. Perry, Charner Perry, and John Dewey, have properly emphasized,[8] our purposes might be wholly miscellan-

[8] R. B. Perry, *General Theory of Value;* Charner Perry, "The Arbitrary as Basis for Rational Morality", *International Journal of Ethics* XLIII (1933) 127-144; John Dewey, *Experience and Nature* (1926) 395.

eous. In that case, the answer to the question, 'What is good?' would be as multiform as the purposes. On the other hand, it is possible that all purposes can be subsumed under a single purpose. In the latter case, to discover the goal of that universal purpose would be to discover *the* good. This, I think, is the sort of answer to the question 'What is good?' which the great axiologists have sought. Its statement, of the form 'The good is x', would be what Schlick calls "the material definition of 'good' "[9] and what Moore calls "the definition of the good".[10] Strictly, however, it would not be a definition at all, that is, it would neither describe merely the use of a word nor assert an analytic equivalence, but would be a synthetic proposition asserting the material equivalence or "commensurability" of the defining characters of the subject and predicate.

A priori, the likelihood of there being one supreme good is no doubt very small. But there is enough real evidence to give it a respectable probability. The bare fact that a single unifying formula for the good has been so assiduously sought is evidence that our purposes demand their own integration. The nature and extent of the integration which actually obtains are open to such empirical researches as those of Tolman and Perry.[11] A purpose or desire, as commonly demarcated, has two components, a conative tendency (interest), which can as a matter of fact be satisfied by a certain kind of situation, and a judgment as to the kind of situation which can satisfy it. By virtue of these components, purposes organize themselves in an elaborate hierarchy. Ultimately and in the strictest sense, so far as I can see now, I mean by 'the good' *what I really desire*, and what I really desire is what I desire more than all else, what I desire for its own sake, what I should desire if I knew all the relevant facts about myself and the universe, and in particular what I should desire if the judgment-component of the desire were an accurate knowledge of what would satisfy its interest-component. No doubt it is the frequent disparity between such 'real' desire and the ruck of miscellaneous, minor, and *de facto* purposes which obscures the fact that 'good' means no more than accordance with my desires. That there is, for me, only one such 'real' purpose seems a plausible psychological estimate. This purpose has the authority of a commitment. Loyalty to it is conscience. To be false to it, to break one's promise to oneself, is self-mutilation and suicide.

The evidence for unity of purpose extends, however, further than the scheme of any one man's purposes. It suggests a congruity between person and person, between people and people, perhaps between species and species. To some competent persons it has suggested not merely

[9] Moritz Schlick, *Fragen der Ethik* 9 ff.
[10] *Principia Ethica* 8.
[11] E. C. Tolman, *Purposive Behavior in Animals and Men;* R. B. Perry, *op. cit.*

similarity of purpose but actual integration, as if in some not too extravagant sense all life or all the universe were committed to the same coöperative enterprise.

It is not our part, for the present, to discuss these grandiose possibilities, but only to make clear that we do not and cannot ask what *ought* to be the object of the world's desire. The oughtness of a means is conditioned by that of its end, but the oughtness of an ultimate end lies solely in the commitment to it. No event or object just inherently ought to be. If there is one ultimate commitment, its determination must be factual and causal. I have elsewhere suggested that such a single aim might be determined biologically by the nature of life and interest, or metaphysically by some nisus in the nature of things, or logically by the requirement of purposes as such that they be not self-defeating but as rich as possible in possibilities of fulfilment. Perhaps the most promising diagnosis is that the ultimate endeavor, the endeavor which everybody acknowledges so far as he understands himself and the world, is to what can roughly be called abundant life, extent and intensity of sensitivity and effectiveness. But our definition of 'goodness' is quite compatible with the good's being, for instance, eternal immaterial salvation, or the pleasures of the senses, or a simple unanalysable quality, or with there being no *the* good at all.

If there is any novelty in the preceding, it can only consist in taking seriously what is utterly commonplace. I have had the ambiguous comfort of finding that my thesis appears self-evident to alert children of three and four years. Among philosophers, the positivists and pragmatists—Schlick, Dewey, Charner Perry, for example—have suggested something like it.[12] It has an obvious affinity with R. B. Perry's doctrine that value is constituted by the satisfaction of interest, but it differs in one subtle but essential respect. According to Perry, if I understand him, when I say '*x* is good to such and such a degree', I mean that *x* to such and such a degree satisfies some interests of somebody, everybody counting as one and nobody as more than one. According to our present theory, when I say '*x* is good', I mean, if I really do mean it, and am not bulldozed by authority or habit, that *x* accords with an interest or purpose at present actually, on some level, motivating *me*.

[12] At almost the opposite pole of human thought, a re-reading of Spinoza's *Ethics* discloses perhaps the closest parallel to the present doctrine: that the defining character of 'good' is conformity with my interest; that so far as men are rational one man's interests agree and cohere with every other's, and that the ultimate aim of human interest is, in point of metaphysical fact, largeness of life and mind. Mr. Barnett Savery ("The Relativity of Value," *Journal of Philosophy XXXIV* (1937) 85-93) explicitly states and defends a definition virtually identical with ours.

It must be noted that on our view a value-proposition is a factual statement, and the view is thus essentially different from that of those positivists who regard value-expressions as mere *commands* (Carnap, *e.g.*) or *ejaculations* of rage or approval (Ayer, *e.g.*).

That what I truly call good may indeed be congruous with what others truly call good is a happy material truth not entailed by our definition of 'good'.

If there is a certain specious ignobility in our doctrine, it purchases thereby some real advantages. It explains, for instance, the apparently *a priori* equivalence of value and obligation. Especially it explains the *intimacy* of obligation, the fact that, as every reflective man must know, obligations cannot be *imposed*, by God, state, Platonic essence, or simple non-natural quality, but are *accepted*. Goodness impels us because it is the force of our own resolution, and the question, 'What is the profit of goodness?' reveals itself, as Socrates saw, to be in the same category with 'Why is a circle round?'

My essay on "The Definition of Yellow and of Good" was confused not only by slurring the fact that definitions are always of words rather than of things or characters, but also by intimating that goodness must be an experienced character and one carrying an inherent and objective obligation. My "Ethics as Pure Postulate" was confused by its intimation that the commitment to some particular goal would be itself the act of prescriptive definition which establishes the meaning of 'goodness'. Actually, as I see it now, the sole defining character of goodness is fixed by linguistic usage: it is the abstract property of being what a person approves of or is committed to. What other properties are common and peculiar to things having this defining character, if there are such properties, is a question of natural fact, and its answer is the synthetic first premise of ethical science—postulational only in the strained sense that the fact which it describes is a fact about our volitional attitude, and that if we could and did change the attitude the fact would be different.

I strongly sympathize with the person who finds painful a doctrine which seems to leave goodness unrooted and subjective. Although these honorable scruples cannot count logically against the theory, they deserve a reminder of how much absoluteness and objectivity are still left to goodness. In the first place, it is a staunch natural fact that humanity has meant by 'goodness' the status of being the goal of a purpose; and this fact, and the nature and consequences of purpose in general and of particular purposes, are inexorably what they are, regardless of any one's opinions about them. In the second place, the nature of *the* good being once determined by our purposes, its presence or absence, its causes and consequences, are inexorably what they are, regardless not only of our opinions but of our purposes. Finally, if our purposes do pyramid to a supreme purpose, and if this purpose is determined metaphysically by the run of the very texture of reality, goodness and the good turn out to be as thoroughly founded and cosmically as significant as anyone could clearly conceive them to be.

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KANT'S THEORY OF *INTUITUS INTELLECTUALIS* IN THE *INAUGURAL DISSERTATION* OF 1770

KANT'S theory of knowledge in the *Inaugural Dissertation* will remain an enigma unless his theory of *intuitus intellectualis* be carefully considered. In portions[1] of that writing he assumed that there are certain intellectual intuitions available to the human mind, differing from general conceptions in the same way that space and time do, and playing the same fundamental rôle in the science of metaphysics that space and time do in the sciences of geometry and mechanics. The investigation of these intellectual intuitions was for him a study preliminary to the science of metaphysics itself, and involved the consideration of two worlds, the sensible and the intelligible, and the forms and contents of each. In other portions[2] of the same writing, Kant contended explicitly that there are no intellectual intuitions available to man. The *Dissertation* can be understood only if these two contradictory positions be noted in it, and much of Kant's teaching be viewed in respect to the contradiction involved. Two clear and self-consistent, but contradictory, theories of knowledge flow from the assumptions that man has or has not intellectual intuitions. Confusion results from Kant's attempt to combine the second contention with conclusions flowing from its contradictory, the first.

Kant's position in the *Dissertation* based upon the assumption that human beings have intellectual intuitions is briefly as follows:

> We rightly suppose that what cannot be known through any intuition whatsoever is not thinkable at all, and so is impossible.[3]

Everything that is thinkable and possible can be known only through intuition. Objects of sense are thinkable and possible, and they are apprehended through intuition. They are, however, appearances. Real objects are, likewise, thinkable and possible. They are, likewise, apprehended through intuition. They are, however, non-sensuous. They are not apprehended, consequently, through sensuous intuition or its forms (space and time). Hence they must be apprehended through intellectual intuitions. But they are apprehended by human beings. Hence human beings have intellectual intuitions.

This view is fundamental to the *Dissertation*, so fundamental that three of Kant's leading distinctions rest upon it. (1) His distinction between a real and a logical use of the intellect (understanding); (2) his distinction between a qualitative and a quantitative synthesis; (3) his distinction between a whole of representation and a representation

[1] *Diss.* § 1, 2, 16, 17, 25 (in part), Handyside's translation, *Open Court*, Chicago, 1929.
[2] *Diss.* § 10, 25 (in part).
[3] *Diss.* § 25.

of a whole. Let us exhibit Kant's contention that intellectual intuitions are given to man, by tracing these three distinctions in turn.

A logical use of the intellect is common to all sciences[4] (geometry, mechanics, and metaphysics), involving solely the subordination of conceptions to one another by a comparison of common marks, and by reference to the principle of contradiction. Its real use is different not merely from the logical one, but also from sensuous intuition. Its real use is, because real, not merely a logical ordering of material already given to the mind, but a manner of apprehending material. Yet it is not a manner of apprehending the materials of sense. Hence it cannot involve any sensuous intuition or its forms. But all apprehension is based upon intuition. Hence the real use of the intellect must be based upon intuition. Since it is not based upon sensuous intuition or its forms, it must be based upon intellectual intuition. The logical use of the intellect, not concerning the apprehension of any type of material, but merely involving the ordering of materials already given, proceeds identically with the materials of sense and of reality. In human knowledge of the world of sense, there is the act of apprehension by means of sensuous intuition, followed by the logical use of the intellect, clarifying and ordering the materials of sense. In human knowledge of the real world, there is the real use of the intellect (involving intellectual intuition) followed by its logical use, clarifying and ordering the materials of reality. In both cases, the logical use of the intellect operates in a minor rôle subsequent to the act of apprehension.

Whereas the difference between the real and the logical uses of the intellect is the difference between the intellectual apprehension of a special type of object (the real, intelligible object), and the process of ordering objects once apprehended, whatever be their nature; the difference between the real use of the intellect and the act of sensuous apprehension is the difference between two methods of apprehending objects (or relations), and involves a difference in kind between two types of apprehended entities, the real and the sensuous. There are two types of apprehended material, one tainted at its source by its sensuous nature, the other gleaming with reality from the very start; but neither case involves an activity of the mind of a merely clarifying, logical sort. On the contrary, both types, once apprehended, are ordered and clarified by the same logical use of the intellect. The logical use orders appearances, giving them greater universality, but never freeing them from their sensitive source;[5] It likewise orders realities. What has happened to appearances prior to the logical activity of the intellect? Kant is ambiguous concerning this question. What has happened to realities prior to that logical activity? He seems to be clear concerning this question; he holds that the real use of the intellect is involved.

[4] *Diss.* § 5. [5] *Diss.* § 5, end.

In spite of his ambiguity in regard to sensuous apprehension, and his apparent clarity in regard to the real use of the intellect, it is, however, in regard to the latter that his view is on shaky foundations; for, alas, he did not give a single example of an intellectual intuition of a real object, whereas he had already formulated his doctrines of space and time as the forms of sensuous intuition. He contradicted himself in regard to the nature of sensuous apprehension, saying in some places[6] that the intellect passively receives the contents of the world of appearances, and in another place[7] that there is an activity of the mind from which even space and time, the forms of that world, are abstracted. But in both of these accounts of sensibility, he assumed that a set of materials is given to, and being dealt with by, the mind. Similarly, the real use of the intellect means that another set of materials is given to, and being dealt with by, the mind. In both cases, logical abstraction and analysis are subsequent to the process of apprehension. But the materials dealt with by the intellect in its real use are not sensuous appearances given in sensuous intuition. The materials of reality are non-sensuous, and consequently, if apprehended at all, involve intellectual intuitions. But in the real use of the intellect, they are apprehended. Hence human beings have intellectual intuitions.

A second distinction in the *Dissertation* flowing from Kant's view that human beings have intellectual intuitions is the distinction between a qualitative and a quantitative synthesis.

> Synthesis is either qualitative, *i.e.*, progress in a series whose members are subordinate to each other, in each case as consequent to ground, or quantitative, *i.e.*, progress in a series of co-ordinated members from a given part through its complements to the whole.[8]

In one sense, there is a qualitative synthesis from ground to all possible consequents. In the act of knowledge, this type follows upon the process of quantitative synthesis, doing nothing besides ordering and clarifying the material that the latter has yielded. It involves the relation of completely determining ground and completely determined consequent. On the other hand, of chief importance is the quantitative synthesis, involving progress along a series of co-ordinated members to a whole. This process, depending upon conditions of time, can never be completed. Kant realized that the inability of the mind to reach a whole in this fashion is not an argument against the objective reality of the co-ordinated parts (and of the whole), but indicates merely the subjective limitations of our minds. Had he pushed this consideration to its logical conclusion, he would have realized that the co-ordinated members dealt with in this quantitative synthesis are necessarily the

[6] *Diss.* § 10, towards the end; § 15 A, B, C (except the example of incongruent counterparts), and corollary (beginning).
[7] *Diss.* § 15 corollary (end).
[8] *Diss.* § 1, second paragraph, note.

parts of the sensuous world of space and time, and that the "infinite whole" which the mind is subjectively incapable of reaching is the whole of such a world. Instead of doing so, he held that the mind is incapable, on the one hand, of completing in the given sensuous intuition, the quantitative synthesis of the "whole" of the world of sense; and, on the other, of completing, in the likewise given intellectual intuition, the quantitative synthesis of a "whole" of the real world. Although he did not argue from the subjective limitations of the mind to the non-existence of the world of sense, he argued from them to the view that such a world is only one of appearances, holding that in addition to it there is the real, intelligible world, admittedly reached no more completely in the quantitative synthesis (at least by human minds) than the former is reached. Two types of material are dealt with synthetically. On the one hand, there is the world of sense, apprehended by progress in a series of co-ordinated members from a part given in sensuous intuition through its complements to the whole. This process is not completed, and, at some part (because of subjective limitations), it breaks down, and the mind *conceives* the whole. Such a whole is the world of appearances. On the other hand, there is the intelligible world, apprehended by a similar progression along a series of co-ordinated members from a part given in intellectual intuition through its complements to the whole. This process is likewise not completed, and, at some part, it similarly breaks down, and the mind conceives the whole. Such a whole is the real world.

Kant's third distinction based upon the assumption that human beings have intellectual intuitions is the distinction between a whole of representation and a representation of a whole. There is, he held, "form, which consists in the co-ordination, not in the subordination, of substances". "This co-ordination is conceived as real and objective—." "For by embracing a plurality you may without difficulty make a *whole of representation*, but not, thereby, the *representation of a whole*."[9] He distinguished not merely between co-ordination and subordination, but also between two types of co-ordination. Subordination of substances as ground and consequent involves, he meant, an activity of the mind common to all of the sciences, never in itself yielding more than a whole of representation, ideal, however accurate, and never real. A whole of representation involves only the accurate application of analytical principles. Co-ordination, on the other hand, involves the representation of an object, but in two sharply different fashions. In the first case, there are sensuous objects presented or intuited according to spatial and temporal conditions. This presentation does not involve a subordination, but a co-ordination of substances, sensuous in nature. In the second case, there are, however, real, intelligible objects,

[9] *Diss.* § 2.

likewise presented or intuited according to certain conditions, the nature of which Kant was trying to determine. This presentation is also not a subordination, but a co-ordination of substances, non-sensuous in nature.[10] Both types of co-ordination yield a representation of a whole, different from a mere whole of representation. Both types involve a quantitative synthesis different from the merely qualitative synthesis which follows upon the heels of each for the purpose of clarification. A representation of a whole conforms, in some cases, to the conditions of intellectual intuition; in others, to the conditions of space and time. A whole of representation conforms, in every case, merely to the conditions of conception. Objects presented or intuited intellectually are real objects, given in so immediate a fashion as that in which the objects of sense are given in space and time. Objects presented or intuited sensuously are the objects in space and time, given likewise immediately, but subject to those definitely determined conditions of the world of sense, *i.e.*, space and time; rather than to the forms of intellectual intuition.

The theory that human beings have intellectual intuitions is, consequently, fundamental to Kant's views in the *Dissertation*. Upon it rests his contention that there is a real use of the intellect which yields knowledge of intelligible, real objects. Upon it rests his contention that there are two kinds of quantitative synthesis, the one yielding sensuous objects and the other real objects. Upon it rests his contention that there can be a representation not merely of the whole of the world of sense, but also of the real world. In general, upon it rests his entire view that there is a real, intelligible world in opposition to the sensuous world of appearances. As I have said, he came, however, to the conclusion that human beings have no intellectual intuitions, and tried to superimpose this conclusion upon the doctrines traced above. Since those doctrines rest upon the contradictory theory, the result was quite unsatisfactory. Let us sketch this change in Kant's views.

> No intuition of things intellectual, but only a symbolic knowledge of them, is given to man. Intellection is possible to us only through universal concepts in the abstract, not through a singular concept in the concrete.[11]

Here Kant departed from his view that human beings have intellectual intuitions. There were open to him three alternatives in reference to human knowledge of intelligible, real objects. First, such objects are known solely through intuition, which cannot be sensuous intuition; and human beings, knowing such objects, have non-sensuous, intellectual intuitions. This was the view from which he was departing. Second, such objects are known solely through intuition, which cannot be

[10] *Diss.* § 17.

[11] *Diss.* § 10.

sensuous; and human beings, having no such non-sensuous, intellectual intuitions, do not know such objects, which are hence known only by God."[11] This is the view to which Kant would have been driven if he had retained in full his contention that all knowledge is based upon intuition, and that human beings have no intellectual intuitions. Third, such objects are known in either of two ways: either immediately by intuition, which cannot be sensuous, or mediately by conception. In this view, human beings, lacking such non-sensuous, intellectual intuitions, know these objects only in the second way, while God knows them in the first. Rejecting his own contention that all objects are known through intuition, sensuous objects through sensuous intuition, and real objects through intellectual intuition, Kant adopted this third alternative, and held that some knowledge is solely conceptual. He distinguished between God's knowledge of realities and human knowledge of them. All divine knowledge is based upon intuitions. Like human knowledge of appearances, God's knowledge of realities is intuitive. Human beings know the world of appearances by means of sensuous intuitions (including their forms, space and time). God knows the real world by means of intellectual intuition. Human knowledge of realities is different. Such knowledge, Kant held, is not based upon intuition, but solely upon conception. It is symbolic knowledge through universal conceptions in the abstract instead of knowledge through a singular conception (intuition) in the concrete.

Such was Kant's compromise view flowing from his conclusion that human beings have no intellectual intuitions. It left him open to three dangers. In the first place, to avoid the conclusion that human beings have no knowledge of realities, he would be forced to justify his view that some knowledge can be entirely symbolic, abstract, and conceptual, in opposition to his own specific contention to the contrary. In the second place, to the extent that he might be successful in justifying his claim that some knowledge is purely conceptual, he would be forced immediately to answer the charge that all knowledge is purely conceptual, and that sense-perception and intuition are merely modified, blurred, and weakened, forms of conception. If, in proving that some knowledge is conceptual, he could not, at the same time, show that some knowledge is non-conceptual or intuitive, he would be forced to reject his doctrines of space, time, and sensibility, in favor of the very Leibnizian view that he so rigidly criticized.[12] In the third place, even if he

[11] *Diss.* § 25: "But since by no effort of the mind can we attain even in imagination another kind of intuition than that which takes place according to the form of space and time—we regard as impossible all intuition whatever which is not bound by these laws (neglecting the pure intellectual intuition which is exempt from the laws of the senses, such as the divine intuition which Plato calls an idea), and so subject all possible things to the sensitive axioms of space and time."

[12] *Diss.* § 7, 11, 15 C, D.

should be successful in his contentions that some human knowledge (namely, that of realities) is conceptual, and other human knowledge (namely, that of appearances) is intuitive, he would be forced to answer the charge that God's knowledge is the prototype of the latter rather than the former, and hence even God does not have intellectual intuitions. If some human knowledge is conceptual, what is the justification for claiming that it is not of such knowledge that God's knowledge is the prototype, but of human intuitive knowledge of appearances?

In spite of these difficulties, Kant proceeded to elaborate the view that some knowledge of realities is purely conceptual.

> Since, then, no empirical principles are to be found in metaphysics, the concepts there met with are not to be looked for in the senses, but in the very nature of pure intellect, not as concepts *connate* to it, but as abstracted (by the attention to its actions on the occasion of experience) from laws inborn in the mind, and so to this extent acquired. Concepts of this sort are: possibility, existence, necessity, substance, cause, etc.[14]

If some human knowledge be based not upon intuition but solely upon conception, the possession by the mind of certain conceptions is a sufficient guarantee of knowledge. Such conceptions as substance, cause, etc., in brief, the categories, are abstracted from laws inborn in the mind, admittedly upon the occasion of experience. The real use of the intellect is its operation upon such conceptions, and does not involve any intellectual intuition. It yields knowledge of real objects, but such knowledge, because of its conceptual nature, is entirely symbolic and abstract. Primarily by means of the categories of substance, causality, and reciprocity, the mind reaches knowledge of the real world.

> On what principle rests [the] relation of all substances, which, when viewed intuitively, is called space? . . . How [is it] possible that a plurality of substances should stand in relations of mutual interaction, and in this way belong to the same whole called a world?[15]

Space, Kant meant, is the basis of the relations among the sensuous objects of appearance, and this basis can be viewed intuitively. On the other hand, God, he went on to hold,[16] is the principle of the relations among real substances, and He must be viewed conceptually. Space is the "intuitively given possibility of universal co-ordination" of sensuous objects; God is the conceptually given possibility of the universal co-ordination of real substances. From the conception of non-sensuous substances standing in the relation of mutual interaction, Kant concluded that they belong to the same whole, called the real world, in the same way that sensuous appearances in space belong to the world of

[14] *Diss.* § 8. [15] *Diss.* § 16. [16] *Diss.* § 17-21.

sensibility. From the conception of non-sensuous substances mutually interacting, Kant concluded that they depend on a single cause or principle of interaction, in the same way that sensuous appearances depend on space for their mutual relations. But the existence of non-sensuous substances, their mutual interaction, and their dependence on one cause, are all established solely on a conceptual basis, whereas the nature of sensuous appearances and their dependence on space are established intuitively. Therefore, our knowledge of the real world and its dependence on one principle comes entirely from the conceptions of substance, cause, reciprocity, etc.

There are, then, three types of knowledge: human knowledge of appearances, based upon intuition; human knowledge of realities, based upon the categories; and divine knowledge of realities, based upon intuition. The possession of the categories by the mind is sufficient guarantee that human minds may know realities as well as appearances. Such knowledge is possible in spite of the fact that no intellectual intuitions are possible for men. This is Kant's second theory of knowledge in the *Dissertation,* and it contradicts the first.

If Kant had retained his view that whatever is knowable is knowable through intuition, his theory of the nature of the categories would not be evidence that human beings know non-sensuous realities. The categories, however similar their mode of derivation may be to that of space and time, are conceptions or forms of conception, whereas space and time are intuitions or forms of intuition. Consequently, even if it be granted that the mind is in possession of the categories independent of, yet on the occasion of, experience, such possession would be no evidence that they yield knowledge unless they may be referred to intuition. In spite of difficulties lying in portions of Kant's theories of space and time, they are, he consistently held, forms of sensuous intuition; and consequently their possession by the mind is a guarantee that a set of materials, the world of sense, is given, and hence that knowledge of that world is possible. On the other hand, the possession of the categories by the mind is evidence of no knowledge whatsoever unless they be supplemented by intuition. Unless non-sensuous substances be apprehended by means of intuition, their reciprocal interaction and their dependence on one cause are in no way guaranteed by the possession of these categories by the mind. Only if the categories be supplemented by intellectual intuitions can they yield knowledge of a non-sensuous, intelligible world.

Kant attempted to avoid this conclusion by his theory that they yield a symbolic knowledge of such a world, and hence that human knowledge of that world is possible without intellectual intuitions. Aside from the fact that this contention exposed him to the three dangers mentioned above, it represents a complete reformulation, if

not a destruction, of his theory of the real use of the intellect, his distinction between quantitative and qualitative syntheses, and his distinction between a whole of representation and a representation of a whole. A real use of the intellect yields, he held, knowledge of realities; sensuous intuition yields knowledge of appearances; a logical use of the intellect yields no knowledge at all, but is useful merely in clarifying the materials of sense or intelligence. If the real use of the intellect yields knowledge, there must be a set of materials given to the mind to which that knowledge refers. If such materials be the intelligible, real world, then there must be intellectual, non-sensuous intuitions involved. If such intuitions be lacking, the difference between the real use of the intellect and its logical use vanishes, and both uses involve merely logical clarification. The fact that the one use is clarification according to one set of principles (for example, causality), and the other clarification according to the principle of contradiction, is no evidence that there is knowledge in either case, if no materials be given. Unless materials be presented in intuition, any use of the intellect is logical and not real. Again, if there be any quantitative synthesis by the mind other than that along the materials of sense, then such materials must be given to the mind in intellectual intuition, or such a synthesis cannot yield knowledge. Again, if the mind has a representation of any whole other than that of the world of sense, such a representation must involve a set of materials presented in intuition, other than the materials of sense; or else merely a whole of representation results. These distinctions all rest upon the assumption that two sets of materials (the sensuous and the real) are given to the mind, and hence that human beings have intellectual, no less than sensuous, intuitions. By attempting to set up the theory that human beings have conceptual knowledge of the real world by means of categories, Kant cut the ground from under his theories of a real use of the intellect, a quantitative synthesis of the materials of reality, and a representation of the whole of the real, intelligible world. He could not successfully combine these doctrines with the theory that human beings have no intellectual intuitions.

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REVIEWS OF BOOKS

Movements of Thought in the Nineteenth Century. By GEORGE H. MEAD. Edited by MERRITT H. MOORE. Chicago, The University of Chicago Press, 1936. Pp. xxxix, 519.

This is the second in the three-volume series of the late Professor Mead's university lectures. It is a review and analysis of the development of modern thought, in Mead's style of critical reconstruction: historical studies are used for the systematic exposition of his favorite themes.

Mead's conception of modern science as research-science is basic in his thinking, and it influences his procedure as a historian of ideas. Modern science is "a way of understanding the world, so that we can act with reference to it" (288). It is not a system of deductions from self-evident axioms, but a continual revision of explanations to meet growing evidence. Its universals are hypothetical; its first principles, postulates. Assuming that nature is an intelligible order of some sort, we find continually, beyond the reach of our theory, exceptional instances, and the world we investigate is ever disclosing novelty and expanding complexity. In Mead's thinking, an unpredictable future precludes an irrevocable past. Past and future are both novel. Each generation reconstructs its history, and "a different Caesar crosses the Rubicon" (116; *cf.* 417).

From this standpoint we should expect unreluctant radical reinterpretation, and we are not disappointed. In chapter after chapter Mead unveils new aspects of the modern structure of thought, revises traditional sequences of ideas, proposes new and often bold perspectives. The rationalism of early modern science is derived from the medieval ideal of the Creator's infinite intelligence. But this ideal is one of arbitrary authority; the search for rational principles in human nature itself, especially in the field of social philosophy, is regarded as the work notably of Rousseau. In his development of Rousseau's ideas more fully in practical and in theoretical philosophy, Kant is revealed as the philosopher of the Revolution. Post-Kantian idealism is represented as philosophical romanticism, namely, as Europe's attempted recovery of an old world, after the new world of the French Revolution had collapsed through Napoleon's imperialism. The industrial revolution is explained, not as the effect of the invention of machinery, but as resulting from the increase of population and consequent larger markets, with corresponding change in methods of production and distribution, demand for machinery, stimulus to invention. Industry is declared a boon to science; the advance of mechanism, by expanding man's control of nature, is "the handmaid of finality". But the evils incident to industry lead to an early dismissal of Adam Smith's *laissez faire*

optimism; the demand for radical social reform is the deeper note in the utilitarian philosophy, beneath the surface hedonism. A still more radical and "the only logical solution" of the economic problem is presented in the socialism of Karl Marx: utilize the power of industry without its social destructiveness, by socializing production and excluding private profit. Pragmatism is interpreted as "the working of the hypotheses", and thus as a philosophical expression of the research-scientific method. In the idea of evolution the mind sees nature experimenting on a large scale, progressive adaptation as a condition of continued activity. The blind spot of Bergson's philosophy is in his failure to see that free creative flow and interpenetration are not limited to 'intuition' but characterize the objective contents of experience. These ideas, and many others that might be cited are not all sound, nor are they all startling, but they indicate the quality of Mead's mind: alert, synthetic, and always stimulating.

On Mead's own statement (356), the newer and better hypothesis, while not derivable from the older doctrine by mere deduction, must yet "take up" the elements of the older. The new theory, then, must rest the more solidly on larger evidence; the better historical reinterpretation must be better documented. Even less than the traditionalist can the radical afford to stumble in his accounts. In this volume Mead proposes new perspectives and new methods of approach, but he appears often careless in the marshalling of his evidence. In the exposition of "the philosophy of the revolution" and of philosophical romanticism, the romantic strain in Rousseau is neglected and his rationalism is overemphasized. The *Critique of Pure Reason* is treated as if it followed Kant's prior moral-social development of Rousseau's ideas 30 f.). The emphasis on the sense of a defeated revolution and on the yearning for the recovery of an idealized past, in the interpretation of romanticism, necessitates the historical treatment of it as post-Napoleonic. But the reader, invited to study this sort of romantic reaction through three chapters on German idealism, is perplexed to find the presumably post-Napoleonic spirit illustrated by Schiller's *Robbers*, 1781, and by Goethe's *earlier* poetry (65). Kant is proclaimed the philosopher of the Revolution, but after its failure the romanticists are described as returning poetically to the medieval period and pageantry; "on the philosophical side", we are told, "this meant the return to the old rationalistic world, especially as Kant had left it, from the point of view of the self regarded as a thing-in-itself" (85). In the treatment of the post-Kantian idealists, Schelling in particular suffers. Mead apparently feels that he must mention him, but is reluctant to deal with him, and disposes of his philosophy as an artistic synthesis.

It should not be forgotten, as the editor reminds us, that this volume

is a collection of class-lectures and is not to be judged by the standards which govern a treatise carefully prepared by the author for publication. It is doubtful whether the radical reinterpretation which fuses the philosophical revolution and the French Revolution, philosophical romanticism and post-Kantian idealism, could have been revised without sacrificing Mead's entire argument in the first seven chapters. So when, in different lectures, Kant's philosophy, the nominalism of the idealogues, and Condillac's sensationalism are all in turn criticized as the philosophy of the Revolution (25 ff., 432, 435), we see the confusion, but not the way out of it. If post-Kantian idealism is romanticism, the philosophy of a defeated revolution, then the reader needs to be enlightened why its development took place in Germany, which helped to defeat Napoleon and whose "rich life . . . and nationalism expressed itself in vivid ways" that are contrasted by Mead with "the poverty of spiritual development" in post-revolutionary France, which he is bold enough to call "the deadness of the morning after" (428).

We are not, however, speaking of any revision of Mead's argument. But surely the editor, while he "condensed" and "carried along" (vii) the stenographic notes which he was turning into a book, should at any rate have understood and supplied what the stenographer missed, and he should have corrected or deleted the obvious blunders and careless statements in the manuscript. Only a few can be indicated here. The Protestant Reformation is described as "nothing but another expression of the breaking-up of the community in voluntary organizations" (177). Frederick the Great, of whose government we are given two opposite accounts (96, 144 f.), is involved in wars of the Spanish Succession. Reference is made to Napoleon's effort to attract Hume to his monarchical circle (427). In the exposition of Kant's ethics, immoral and non-moral are confused (26, 107). Schiller's famous epigram about the Kantian ethics is reported as a Fichtean parody (107; *cf.* 120). Right after the discussion of Locke's influence on French eighteenth-century philosophy, Cousin and his followers are described as the first French school to seek stimulus from other nations (430 ff., 445). Cousin's intellectual and personal intimacy with Hegel is ignored, and his response to Schelling is interpreted as "an outlet of the French aesthetic nature" (446). Fechner's psychophysics is ascribed to one Fischer, further specified in the Index as Emil (481 f., 513). Henri Poincaré (1854-1912) is on page 490 described as a contemporary of Comte, who died in 1857, and also as "a brother, by the way, of the one-time premier of France", presumably his cousin Raymond Poincaré, who died in 1934. The stenographer's apparent confusion of 'reflective' and 'reflexive' (82, 83) and of 'national' and 'rational' (418, 425), uncorrected by the editor, mars Mead's argument. One reads repeatedly of Rousseau's *volonté général*, of Bergson's

duré, Socialdemokratische Arbeiterpartie; mention is made of Schiller's *Die Rauber,* of the *Manifest der Kommunizten, Democritian, Fichtian.* On page 107 we are told of "an experience which we go through with over against", and on page 245, of "what people were interested in in the steam engine".

The editor's evident devotion to his revered teacher should have cleared up some of these blunders and obvious slips in informal lecturing. He should also have kept similar ones out of his own Prefatory Note and Introduction, beginning with the first paragraph in each of these. While Mead speaks of Leibniz as a Renaissance philosopher (1) his editor regards the Age of the Enlightenment as the immediate successor to the medieval period (xxviii). Merz's *History of European Thought in the Nineteenth Century* is mentioned twice, both times by a wrong title.

The decision to undertake the publication of class-lectures which an eminent thinker had not intended for publication in their present form, but by which he was bound to be judged all over the world, imposed on the editor the responsibility of the most scrupulous care in the preparation and correction of the stenographic copy and lecture-notes. This responsibility has not been adequately met by the editor of the present volume. This is the more regrettable in view of the undoubtedly stimulating and enlightening power of Mead's thought in these lectures, which is bound to be recognized even by those who may not find his exposition always convincing.

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History of Mediaeval Philosophy. By MAURICE DE WULF. Volume I. New York, Longmans, Green, and Company, 1935. Pp. xiv, 319.

Professor De Wulf's *History of Mediaeval Philosophy* has long been the most popular, if not indeed the only, available textbook on the history of philosophy in the Middle Ages. It has gone through six editions in the original French and the book here under review is the first volume of a third English edition of this well-known work.

The sixth French edition, upon which the translation of this volume is based, differs in some notable, though minor, points from previous editions of the work. The general plan of the author's presentation of his material is the same, but the method of treatment has been somewhat modified. Professor De Wulf gives fuller play than he hitherto did to objective analysis in dealing with the individual writers whose thought he discusses, yet he does not entirely forsake the synthetic view of mediaeval philosophy which has made his famous phrase *The Scholastic Synthesis* a veritable slogan. The epithet, *Antischolastic,* however, as applied to mediaeval thinkers whose views were out of

harmony with *The Scholastic Synthesis*, has been dropped because it has lost its significance and relevancy in view of the more objective treatment of the individual writers on philosophy in the Middle Ages, a treatment which is presented in chronological rather than systematic order. This change is nevertheless verbal rather than real. For the contrast between the views of "eccentric" thinkers and the patrimony of doctrine common to the great majority of mediaeval philosophers still remains, although it is less important, from the historical point of view, to insist upon it.

Further modifications may be observed in the author's somewhat more developed discussion of Boethius and his definite rejection of the charge of *monism* levelled for years against John Scotus Erigena. One may also note that the spelling *Erigena* is adopted instead of *Eriugena* as it appeared in previous editions. Yet the note on page 121 informs us that the latter spelling is the one found in early manuscripts.

The Bibliographies have been reorganized and considerably augmented through the generous collaboration of Professor Van Steenberghen. The excellent bibliographical references given in Ueberweg-Geyer's *Grundriss* have not been repeated.

The translation has been adequately made by Dr. E. C. Messenger, a former pupil of Professor De Wulf, who therefore has the advantage of close acquaintanceship with the author's thought and diction.

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Jean-Jacques Rousseau, Moralist. By CHARLES WILLIAM HENDEL. 2 Vols. New York, Oxford University Press, 1934. Pp. xii, 316; vi, 348.

Psychology is not logic. It may, however, provide a valuable guide in the interpretation of error in logic. It is thus that Professor Hendel uses it, interpreting Rousseau's thought by his personal biography during his working years. If there are any criticisms of Professor Hendel's work it is that, the child being father of the man, he does not explain to us the moulding influences of Rousseau's deplorable early years, and that it is perhaps scarcely clear for what public these two volumes are designed—scholarly but without textual criticism (save for four brief appendices) as in Vaughan, readable but without the style of the original, valuable but without much fire in the belly.

Rousseau is the supreme instance that shows how a man may be a moral philosopher without being a moral man, indeed the "compleat cad"—not even a great penitent like Augustine (save on paper) or a man of worldly polish like Bacon, but merely a prime prig. One of the most pathetic delusions in history is that philosophers, the road-

breakers, are moral guides in the straight and beaten way—but when they have, as Rousseau, the *cœur sensible* (even with contemptible personalities), they may be moral interpreters of, and to, the fellowmen of their age. Rousseau is the Villon of moral philosophy—although a very inferior Villon, a man of despicable vanity who wished both to eat his moral cake and keep it, but who happened to be a fine artist. For those who wish to study this potent amalgam of incongruities, bad husband, bad father, bad friend, who swayed the hearts of his generation and gave impetus to the ideals of a Revolution, Professor Hendel's two volumes will be found indispensable. It does credit to the present condition of scholarship that, despite the invitation that we should all step into the arena of propaganda, students are to be found who will devote themselves to such labors of love.

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Pareto's General Sociology: A Physiologist's Interpretation. By LAWRENCE J. HENDERSON. Cambridge, Massachusetts, Harvard University Press, 1935. Pp. ix, 119.

It is now two years since the appearance of the English translation of Pareto's treatise. The strife of eulogists and decriers which began at once has almost ceased. It seems safe to predict that nothing they have written will be found to have permanent value, with the single exception of Professor Henderson's little book, but that it will go down as a minor classic in the field. Though it contains a great deal of sympathetic interpretation of Pareto, it has independent interest as an essay on methodology by one whose comparative ignorance of the literature of the subject is not without its advantages. His chief contribution lies in a rather elaborate analysis of "the social system", a concept which Pareto seems to have used without being fully aware of its position in his treatise and without an adequate accounting. Professor Henderson works out at great length the analogies between it and the physico-chemical system of Willard Gibbs, indicates briefly its analogies with the solar system, and traces the development of the concept in Pareto's previous work as an engineer and economist.

There is less that is distinctive in his account of Pareto's residues and derivations, but he anticipates and skilfully answers the objections that have been made to the careless use of the term "non-logical actions", by showing that it is scaffolding and not an ultimate category of the system. There is, in fact, no exposition of Pareto which so persuasively meets the criticisms of his detractors, either by admitting their validity but denying their importance, or by ascribing them to misunderstanding natural in those who do not approach him with a background at least as much like his own as Professor Henderson's has been. One comes away from the essay with a sense of the greatness

of Pareto's achievement which, on a first reading of the treatise itself, would be suggested by nothing but its bulk.

His praise, however, is by no means indiscriminate; he admits, for instance, that the classification of residues is "excessively simple", and in one of those terminal notes which together outswell the essay, he intimates that writers on the philosophy of science, like Pareto himself, suffer from ignorance of chemistry, whose classification of organic compounds "is today perhaps the most complex and elaborate classification that exists". We are made to feel that Pareto used to the full, though not always consciously, his background in mathematics, physics, and economics; but "these experiences [of the organic chemists] also must be exploited, if sociology is to take full advantage of the successes and failures of the other sciences". It is to be hoped that Professor Henderson will not wait for the sociologists to take his advice, but will show them the way. Their rather splenetic reviews of the treatise indicate an unwillingness to learn from Pareto, or a persuasion that the little he had to teach them they had long ago learned from others. (A notable exception is the dispassionate and judicious discussion in this *Review*, XLV (1936), 303-313.)

In the end, the sociologists may be right in all but the spleen, and not without provocation in that. To carry out Pareto's program as interpreted by Professor Henderson, they would have to act as if they did not know a great deal which, after all, they know well enough, and they would have to postpone indefinitely the attempt to meet the practical problems of society which press upon them for some sort of working solution. They are not employed to prepare rough drafts for an academic address to an uncertain posterity. And the consolations of such a pure science of sociology as Professor Henderson projects are remote and doubtful. He himself admits, when all is said, that "those who wish to enjoy the conveniences that the physical sciences afford must still cleave to the physical sciences".

To conclude: The philosopher, at least, will find this essay a useful point of departure for consideration of the methodology of the social sciences. It is rather lacking in realism, however, on the question just what Pareto himself was doing. For that one must turn to the more recent book by Franz Borkenau (1936), or the suggestive but unintentionally deflating interpretation by F. Creedy of "the paretian analysis of documents" (*Journal of Social Philosophy* I (1935-36), 175-179). For social philosophy as such, neither Pareto nor Henderson offers more than a healthful astringent. How long will we continue to look abroad and ignore the really profound work that is being done at home, by, say, Elijah Jordan?

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Contributions of the Idealogues to French Revolutionary Thought. By CHARLES HUNTER VAN DUZER. Johns Hopkins Press, Baltimore, 1935.

The Cult of Antiquity and the French Revolutionaries. By HAROLD T. PARKER. University of Chicago Press, Chicago, 1937.

In 1802 Destutt de Tracy coined the term "Idealogy" to denote the philosophy of those who accepted whole-heartedly the implications of the sensationalist psychology of Locke and Condillac: *viz.*, that man, being a product of his environment, can be perfected by transforming the social institutions in which he lives. Limiting himself to the "Idealogues" in this narrow sense, Mr. Van Duzer traces in detail, and somewhat laboriously according to the best academic tradition, the "influence" on the social legislation of the revolutionary assemblies. The use of the terms "Idealogy" and "Idealogues" in this sense is somewhat unfortunate, particularly because in recent years "Ideology" has come into common use to denote any general social philosophy, as, for example, the Liberal Ideology, the Communist Ideology, the Fascist Ideology, and the like. Aside from that, the disciples of Condillac, so far as their social ideas are concerned, did not differ essentially from the general run of eighteenth-century *Philosophes*. Mr. Van Duzer notes, apparently with approval, the remark of Mathiez that "the central idea of eighteenth-century philosophy was the belief that man could infinitely improve his lot by modifying the social organism" (96). In this essential sense the *Philosophes* were all "Idealogues"; and so the contribution of the Idealogues to revolutionary thought turns out to be much the same as that of the *Philosophes* in general. These are, nevertheless, small points. Mr. Van Duzer's brochure is a very useful contribution to the intellectual history of the French Revolution—particularly so, perhaps, in respect to the field of education.

Mr. Parker's contribution to the intellectual history of the Revolution is, I think, more valuable than that of Mr. Van Duzer (although that may be a prejudiced opinion, since I had some small share in directing Mr. Parker's work), because he has given us a detailed and discriminating study of an aspect of the Enlightenment which, although often recognized, has never hitherto been systematically explored. He has undertaken the difficult task of determining just why Mme. Roland often wept to think that she had not been born a Spartan or a Roman, to determine to what extent the rigid and self-conscious austerity of a Saint-Just or a Robespierre was modeled upon their notions of Spartan or Roman "virtue". In short, he has tried to determine with some exactness to what extent and in what ways the thought and activities of certain revolutionary leaders were influenced by their admiration for classical heroes and classical institutions.

He begins by telling us with statistical exactness what classical

writers, and histories of classical times, the revolutionary leaders studied in college, or were otherwise familiar with. He does not, however, make the elementary mistake of supposing that a man must have admired and endeavored to imitate Cato or Brutus merely because he had read Plutarch's account of them. The truth is that virtually all educated men were equally familiar with classical writers and classical institutions, and all through much the same books, that is to say, through the writings of Cicero, Horace, Plutarch, Tacitus, Vergil, Seneca, Livy, Sallust, Plato, Montesquieu, Rollins, Rousseau, Voltaire, and Mably. Mr. Parker tries to determine which of the revolutionary leaders were notably "influenced" by these writers in the sense of acquiring an admiration for classical heroes and institutions. In general he finds that those who were thus influenced were the most radical of the leaders. Before the Revolution began these men were likely to regard the classical world as a kind of vanished golden age, which could not be restored, but in which, could they have lived in it, careers would have been more freely open to their peculiar talents. Even during the early years of the Revolution they saw no possibility of restoring this vanished golden age; but with the establishment of the Republic in 1792, the "imitation of antiquity, hitherto a remote impossibility, could now become, in the minds of many, an imminent, practical reality" (120). Antiquity was, however, not all of a piece; and there were sharp differences among revolutionary leaders as to whether Solon and Athens, or Lycurgus and Sparta, should be taken as the model. Desmoulins was the chief of those who preferred the former, Saint-Just the chief of those who preferred the latter.

Mr. Parker's exploration of this subject is an extremely valuable contribution to the intellectual history of the eighteenth century. Not the least of his virtues are his restraint and his discrimination: he does not push his thesis beyond the evidence, or make generalizations without the qualifications which the evidence calls for.

CARL BECKER

CORNELL UNIVERSITY

Rudolph IV. von Österreich, I. Von ERNST KARL WINTER. Wien, Reinhold, 1934. Pp. xvi, 410, and 24 plates.

Rudolph IV. von Österreich, II. Von ERNST KARL WINTER. Wien, Gsur & Co., 1936. Pp. xvi, 532, and 28 plates.

Dr. Winter was till recently Vice-Burgomaster of the city of Vienna, under the Dollfuss-Schuschnigg régime, with the special task of building a bridge between the new government and the workers, whose political, trade-union, and cultural organizations it destroyed in the civil war of February 1934. To this contemporary activity in Austrian politics the author owes in part his interest in the personality and policy of Rudolph IV, whom he regards as the founder of a dis-

tinctly Austrian program of "Frühsozialismus" as well as the defender of a peculiarly Austrian idea of the state against the *regnum theutonicum* as a whole (I, ix and xiii). Dr. Winter's striving to illuminate the problems of our day by reference to those of the fourteenth century is often stimulating; at times, however, he reads into the actions of his hero motives and conceptions which no ruler of the time held, as when he describes as a "collective agreement" the command of 1330, ordering the farmers of the salt-mines to pay their workers properly (I, 49). Instead of a closely knit and convincing *exposé* of his guiding concept, Dr. Winter has given us a series of penetrating and erudite studies in the economic life and thought of fourteenth-century Austria. It is to his analysis of credit and credit-policy and to his study of Heinrich von Langenstein that scholars will turn with profit, rather than to the modern implications which he believes can be drawn from them.

Dr. Winter has worked out a keen interpretation of the problem of credit in the late feudal period, under Austrian conditions. He shows how the sale of *rentes* transferred capital surplusses from feudal to urban economy, where it was most needed; he regards the rulers' debasements of the currency as a means of regulating this movement of capital by checking credit-inflation and lessening the pressure of the feudal creditors upon the urban debtors, rather than primarily as a fiscal measure. For Dr. Winter the papal-imperial contest is mirrored in the struggle between the perpetual *rentes*, which were favored by the Church as enhancing the power of consumption, and the temporary and extinguishable interest-loans, which were preferred by the artizans of the gilds and by the rulers. Rudolph's renunciation of the right of debasing the currency, together with his proclamation of the right to redeem perpetual *rentes* at the low rate of eight to one (12½ per cent), represented a coherent credit-policy which he intended to consolidate by establishing a Lombard Bank to issue loans at a fixed rate of interest; this corner-stone of his reorganization of the credit-system was destroyed by the Emperor's refusal to grant a charter for the bank, on the ground that it would constitute a violation of the ecclesiastical ban against usury. Thus his plan to make productive capital available for the gilds at a moderate rate of interest and without recourse to the licensing of Jewish money-lenders was defeated by ecclesiastical influence. Into this struggle Winter reads the conception of a Church favoring "anarchical" capitalism and a ruler aiming to create a "directed" capitalism through controlling the flow of credit. Finally it becomes clear that his "Frühsozialismus" is at bottom an attempt by the Duke to centralize the control of credit and thus to regulate its volume (I, 180). In reaching this strained conclusion the author ignores his own detailed treatment of the ruler's desire to create

a central bank in which to deposit his revenues, instead of allowing his officials to speculate with them in the interval between their collection and the periodical accounting. If this is "socialism", it is time to elaborate a new set of terms, for the older set is obviously wearing thin.

Probably the most valuable part of this massive study lies in its interpretation of the economic teachings of Heinrich von Langenstein, who taught at the University of Vienna in the last quarter of the fourteenth century. Langenstein has been regarded as a supporter of Rudolph's attack on the perpetual *rentes,* to which the Church clung. Winter demonstrates convincingly that Langenstein was merely applying the scholastic method of "pro" and "con" by stating with great force the lay arguments against the *rentes;* to confute the lay thesis, upheld by the Coiners' Gild and the Duke, he relied on the traditional Thomistic reasoning on usury and its prohibition. Although he stated with remarkable clarity the lay objections to the concentration of wealth by the ecclesiastical mainmort, Langenstein defended the possessions of the Church by those very scholastic arguments which the Duke could not reject without falling into heresy. From Winter's treatment Langenstein emerges with fresh significance as an original economic theorist of the scholastic period.

PHILIP E. MOSELY

CORNELL UNIVERSITY

Aristotle's Physics. A revised text with Introduction and Commentary. By W. D. Ross. New York, Oxford University Press, 1936. Pp. xii, 750.

The Provost of Oriel College has, with this publication, done for the *Physics* the same service which he had already performed for the *Metaphysics* and in the same masterly fashion. As a result of his meticulous study of the manuscripts and of the tradition preserved in the ancient commentaries he has produced a text which probably resembles that written by Aristotle as closely as any that time will ever permit us to read. There will still be debate about the reading of particular passages; but in countless places the new reading or improved punctuation introduced by Professor Ross will command unhesitating and universal approbation.

The text itself is preceded by an Introduction in which are discussed the structure of the *Physics* and the manuscripts on which the text is based; here also is an outline of Aristotle's natural philosophy. Following the text and preceding the commentary there is a detailed analysis amounting to a paraphrase of the entire *Physics;* this arrangement is a distinct improvement over that used by the editor in his *Metaphysics,* where the intertwining of analysis and commentary causes constant confusion. The commentary is concerned primarily with the elucida-

tion of the text; inasmuch as this is the proper function of a commentary, it is perhaps ungrateful to complain that the editor did not permit himself to discuss with greater fullness the connection of certain passages with the larger characteristics of Aristotle's system and with Greek philosophy in general. It would not have been irrelevant to note, for example, that, while Aristotle argues as if the "whole-natured forms" preceded the "ox-like monsters" in Empedocles' account (199 b 5 ff.), these two phenomena belonged in the original to different periods of the world-cycle. So, too, one rather expects at 210 a 2-5, where it is said that motion to the proper place is incompatible with the conception of place as matter or form, a reference to *De caelo* 310 a 31 ff. where movement to the proper place is called τὸ εἰς τὸ αὑτοῦ εἶδος φέρεσθαι; and at 267 a 2-7 it would have been pertinent to call attention to the fact that Aristotle's solution of the problem of projectiles contradicts his general theory of motion, inasmuch as it requires a material body to be capable of imparting motion after it has itself ceased moving, in other words that such a body, though no longer in a state of actuality, can produce actualization in a patient (*cf.* 201 a 23-25, 202 a 3-21). The omission of such notes is probably due to the commentator's conception of the proper limits of his task, a conception which this reviewer shares in principle; sometimes, however, a too rigid interpretation of this principle has kept Professor Ross from including comments which would have helped the reader to see the *Physics* as an integral part of Aristotle's systematic philosophy instead of as an isolated text.

Zeno's paradoxes have been treated with more liberality, both in the commentary and in the introduction. The fundamental problem raised by these paradoxes has not yet been solved, in the opinion of Professor Ross, who nevertheless implies that Zeno himself was not really aware of the true significance of the problem. At any rate he believes that Aristotle's solution in *Physics* VI was an adequate answer to the first argument as Zeno put it and that, consequently, Zeno did not note the "complete parallelism between the nature of space and that of time". It is very difficult to accept this interpretation if one holds that the four paradoxes form a single systematic argument addressed to a single set of opponents, but Professor Ross thinks that it cannot be maintained that all four arguments were directed against a single thinker or school (656) and believes that the fourth "was more probably aimed at Empedocles than at any other" (657). This last assertion really depends upon the notion that Empedocles believed in indivisible bodies: that he did so Professor Ross asserts on the authority of Stobaeus and Pseudo-Plutarch, whose statements concerning the belief of the Pythagoreans in infinitely divisible bodies he, on the other hand, rejects as untrustworthy. That their statements concerning Empedocles are equally wrong appears from the fact that Aristotle, in spite of his

frequent attempts to make an Atomist of Empedocles, admits that he did not assert the indivisibility of bodies (cf. *De caelo* 305 a 2 ff.). Since it would be impossible to discuss the purpose of the paradoxes with any degree of adequacy here, I confine myself to a reference to the recent work of H. D. P. Lee, *Zeno of Elea,* in which the unity of the four paradoxes is again defended and the opponents against whom Zeno directed them are identified as Pythagoreans.

The composition of the greater part of the *Physics* Professor Ross places toward the end of Aristotle's first residence in Athens, while Book VIII even "in its earlier form" he thinks cannot be earlier than the final stay in Athens. At the same time he admits that the references to this book in the *De caelo* "lend colour to the view that *Phys.* VIII *may* itself be early". Of the three passages which Professor Jaeger has identified as later additions (258 b 11, 259 a 6-13, 259 b 28-31), the first two Professor Ross sees no reason to take as such; the third only he thinks is an addition "made after he [Aristotle] had reached the final view which he states in *Met.*Λ". Book VII, however, he thinks "may perhaps belong to the Assos period"; it was superseded by VIII and was incorporated into the *Physics* "sometime in the third century B.C." He does not concur in Hoffmann's view that VII is more elementary than other parts of the *Physics,* but rejects Carteron's theory that it was written after VIII in order to prepare the way for this book more thoroughly; the reason for this rejection is that 246 b 4-8 and 249 b 23 seem to him to show that the book is early. Professor Jaeger took these passages as indications that Aristotle had not yet broken away from the Platonic School (*Aristoteles,* 42, n. 1 and 313, n. 1); but Professor Ross recognizes that 241 b 39-44 (= 241 b 27-33) "indicates that, on one point at least, Aristotle has already diverged from Plato's teaching". I would add that a comparison of *Physics* VII, 245 b 6-246 a 3, with *De gen. et corr.* 329 a 8-24 shows the former to be a criticism of what Aristotle considered to be Plato's confusion of genesis and alteration due to his failure to give a proper account of "matter" in the *Timaeus,* and so indicates a further "divergence" from Plato's teaching. With regard to 246 b 4-8 it need only be said that, although Professors Ross and Jaeger assert that the ἀρεταὶ σώματος are found only here and in the *Topics,* both the *Rhetoric* (1361 a 3, 1361 b 3, 1362 b 14-18) and the *Nicomachean Ethics* (1102 a 16, 1104 a 11-19) refer to the bodily virtues. That 249 b 23 does not indicate that "Aristotle is still treating it as an open question whether the Platonic reduction of essence to number is correct", and so does not date this book in a period when he had *not yet* abandoned the Platonic theory, is clear enough from his assumption that number is ὁμοειδής, for this contradicts both Plato's and Xenocrates' theories of substantial number (*cf.* Ross, *Aristotle's Meta*

physics, I, lii). Aristotle himself asserts that if numbers are comparable there can be no ideal numbers but only mathematical number (*Metaph.* 1081 a 5-7). I have elsewhere pointed out that he charges the Atomists with making substance "number" (*De caelo* 303 a 8-10) and that he tries to reduce the theories of the "Ionian monists", Heraclitus and Empedocles, to the same essential "absurdity" (*Aristotle's Criticism of Presocratic Philosophy*, 15-16 and 60). It is what he considers to be the tendency of Platonists, Atomists, and "physical philosophers" alike to reduce qualitative to quantitative difference that he has in mind here rather than any theory of "ideal numbers". The statement that there is no term for the relation of substances in generation as there *is* for the greater and less in quantity must indicate an objection to the theory that substance is number *in any sense*, for to Aristotle number is just quantitative measurement (cf. 207 b 5-11). Incidentally, I cannot believe that Professor Ross's punctuation of this corrupt passage is correct; the whole passage, οὐ γὰρ . . . μεῖζον, must, I still think, be a single parenthesis.

It is impossible, however, to discuss here the many new readings and interpretations in this edition which I would applaud or the few which have failed to convince me. It will be more helpful to call attention to the misprints (remarkably few for a book of this size) which readers may not be able to correct automatically. On page 13 "the other second book" (*bis*) should be "the other seventh book"; here once the symbols bcjy are misprinted bejy. In 230 a 17 φθορῷ should be φθορᾷ. On page 467 Eudemus is an error for Eudoxus, and on page 591 Empedocles should be Epicurus. On page 619 a superfluous "which" has crept into the note on 225 a 29; some few wrong accentuations will cause no misunderstanding.

HAROLD CHERNISS

THE JOHNS HOPKINS UNIVERSITY

DESCRIPTIVE NOTICES

Pascal. The Life of Genius. By MORRIS BISHOP. New York, Reynal & Hitchcock, 1936. Pp. xiv, 398.

This is a discriminating, artistic, and scholarly work. Mr. Bishop has brilliantly portrayed Pascal as a many-sided man of genius, a scientist, *mondain*, man of letters, and man of God. Though Pascal always dominates the picture, he is properly portrayed among the scientists, the churchmen, and the theologians of seventeenth-century France. Extensive, well chosen, superb translations of many significant passages provide a most satisfactory sampling for readers who have never had the satisfaction of a first-hand acquaintance with his works. Courageous, well-grounded, positive opinions are expressed on many delicate long-disputed questions relating to Pascal.

"Pascal manifests those qualities which the French ascribe to French genius: intellectual abstraction with practicality, logic with mysticism, the spirit of geometry with the spirit of finesse, the gift of humor with poetic imagination." Mr. Bishop's Pascalian ecstacy is so nearly unitive that his book is an indispensable approach to this great "Life of Genius".

ROBERT E. ROCKWOOD

THE OHIO STATE UNIVERSITY

Problèmes d'histoire des religions. Par JEAN BARUZI. Paris, Félix Alcan, 1935. Pp. 152.

Professor Baruzi has entitled the first of the three essays that compose his latest volume "Remarks on the present state of the history of religion". Given originally as an inaugural lecture at the Collège de France, it is devoted chiefly to a review of the work of two of his immediate predecessors, Carles Andler and Alfred Loisy. The remaining part of the essay is chiefly interesting for its insistence on the idea that the history of religion should not be regarded as a mere historical study but as an attempt to arrive at some critical evaluations of the phenomena with which it deals. The second essay—"The Problem of Form and Contemporary Exegesis"—deals with some problems of scriptural interpretation and refers almost exclusively to the work of two German scholars, Dibelius and Bultmann. The last essay—"On an Hypothesis of Asín Palacios"—discusses the possibility of a Mohammedan influence on St. John of the Cross. The book as a whole has nothing to offer to any but a small group of specialists in the field of the history of religion, and even for these I suspect that its worth will be small.

SVEN NILSON

HARTFORD, CONNECTICUT

Metaphysik als Naturwissenschaft. Von CARL FRIES. Berlin, Emil Ebering, 1936. Pp. 80.

Uncritically accepting Ludwig von Bertalanffy's organismic notions in theoretic biology, Dr. Carl Fries speculates on extending the voluntaristic intuitionism of the latter into metaphysics. The teleological and totalitarian properties of all existence are to be established by intuitive empiricism rather than abstract rationalism. Such classical criticisms of teleology as

are given by Spinoza and Jacob Fries are dismissed without due consideration (71, 78). How the sciences can proceed systematically on this sort of shoddy intuitionism and voluntarism is not at all clear.

PHILIP PAUL WIENER

COLLEGE OF THE CITY OF NEW YORK

La fisica nuova. Fondamenti di una Teoria della Scienza. Per NICOLA ABBAGNANO. Napoli, Alfredo Guida, 1935. Pp. 128.

After criticizing current epistemological solutions to the problem of the relation of science to philosophy (part I), Prof. Abbagnano gives an exposition of the methods and concepts used in the recent theories of physics (part II), and then expounds his own transcendental principle of knowledge (part III). The latter is formulated (99) as having "I. An absolute spontaneity, understood as the unlimited productivity of phenomenological determinations. II. An absolute logical *rigor*, understood as the unlimited potentiality of rational organization and systematization." In the light of this twofold principle, which treats the subjective and objective as correlative phases of a unitary act of thought, the author attempts to clarify the probability-functions in atomic theory, Dirac's law of the superposition of states, and Heisenberg's principle of indeterminacy.

PHILIP PAUL WIENER

COLLEGE OF THE CITY OF NEW YORK

Le concept d'angoisse. Par VIGILIUS HAUFNIENSIS (SÖREN KIERKEGAARD). Traduit du Danois par P.-H. TISSEAU. Paris, Félix Alcan, 1935. Pp. iv, 240.

The subtitle describes the work as "a simple psychological meditation designed as introductory to the dogmatic problem of original sin". Sin cannot be treated as a psychological problem, but 'dread' must be. It precedes sin. It is a condition of the 'spirit' and hence is not found in animals, though present in children and in dreams. The object of dread is not named, indeed Kierkegaard affirms that it has 'nothing' for its object; yet it is closely connected with the sexual life of man. In spite of the profundity of observation which Heidegger finds in this work of Kierkegaard's—and there is acute introspective analysis—one ventures to suggest that an anxiety-neurosis with markedly sexual components constitutes a serious obstacle to objectivity in either psychology or theology. But then Kierkegaard was an intense subjectivist and individualist. The volume includes an extensive introduction by Jean Wahl.

H. M. ESTALL

QUEEN'S UNIVERSITY

Religion within the Limits of Reason Alone. By IMMANUEL KANT. Translated with an Introduction and Notes by THEODORE M. GREENE and HOYT H. HUDSON. LaSalle, The Open Court Publishing Co. 1934. Pp. lxxxv, 200.

This is the first complete translation of Kant's *Religion innerhalb der Grenzen der blossen Vernunft.* The translation is both smooth and accurate. It is accompanied by an abundance of notes. The introduction gives an excellent general sketch of Kant's philosophy, with especial reference to

his treatment of religion. It was well to have this work done. Kant's treatment of religion in terms of his exalted moral rigorism represents the limit of what can be thought in such a direction. The Introduction speaks rightly of his one-sidedness, though it might speak more emphatically. It is singular that a thinker of such penetration, one who was so well-read in anthropology, should be so blind to the social and individual psychology of religion. The emotional and mystical elements in the religious attitude were simply ignored by Kant.

J. A. LEIGHTON

THE OHIO STATE UNIVERSITY

Philosophie der tragischen Strukturen. Von JOACHIM POHL. Wien, Wilhelm Braumüller, 1935. Pp. viii, 104.

Pohl offers in this little book only the first and largely critical part of his work, under the subtitle "The Metaphysics of Knowledge". In chapter one he furnishes us with what is probably the most devastating criticism of Husserl's phenomenology that has yet appeared in print. The other four chapters carry through an equally destructive but much more cursory criticism of other types of idealism, especially of Kant's transcendental idealism and of Descartes' and Berkeley's radical idealism. The title of the book is likely to be misleading. But its content is an important contribution to criticism of all current types of epistemology which lay claim to be metaphysics without having either a clear understanding of their basic distinction or the courage to carry the distinction through. For after all, *being* and *knowing* are not identical, unless all ordinary usage of language is blissfully thrown to the winds.

PAUL ARTHUR SCHILPP

NORTHWESTERN UNIVERSITY

Fortune and Fate from Democritus to St. Thomas Aquinas. By VINCENZO CIOFFARI. New York, 1935. Pp. viii, 130.

The author of this work tries to treat of fortune and fate conceptually and to account for the changes that were introduced as these concepts passed from one system to another. He begins his exposition with the Democritean automaton, then passes to the Aristotelian conception of *tyche*. In the third chapter he expounds Plato's doctrine of fate and traces the terminology through Apuleius, Hermes Trismegistus, Macrobius, and Martianus Capella. In the last chapter he takes up the Christian interpretations, showing the relation between fortune, fate, and providence.

In view of the fact that Dr. Cioffari intends to write on fortune and fate in the thirteenth and fourteenth centuries, it may be useful to point out some of the difficulties inherent in the present volume. First, it is difficult to see how fortune and fate can be treated without integrating these concepts with the social, economic, and political conditions of the various periods. Second, while quotations constitute the evidence for whatever points one wishes to make, complete enumeration of all the evidence makes the reading very trying. In addition, the author has added many quotations which are irrelevant to the specific problem and confusing to reader. Third, in the very first chapter he identifies mechanism with determinism, although there is a great difference between the two. The author

spends fifteen pages in the attempt to show that Dante's famous line "Democrito che il mondo a caso pone" is a sound piece of information, without making clear what Aristotle, Cicero, and Dante implied in their criticism of Democritus. What these writers meant is that Democritus does not admit a *principle* in order to explain mechanism; for him mechanism is explanation. Fourth, one may justly expect a summary of the author's thesis, but one finds none. In brief, the philosophical concepts employed in this work need a complete reexamination in order to make the work intelligible.

ALEXANDER LITMAN

NEW YORK CITY

Seele und Staat. Von HANS ALFRED GRUNSKY. Berlin, Junker und Dünnhaupt, 1935. Pp. viii, 124.

Under the thinly veiled guise of a psychological investigation the author develops the propagandist thesis that blood (race and tradition) and spirit (Idea and state), the constituents of individual and community souls, have their true being only in relation to vitalizing will. The individual can find true selfhood only in national socialism, the dynamic union of Germanic blood and political Idea. The liberal man, on the other hand, flounders about in endless vacillation, indecision, and inaction. Quite unoriginal and altogether negligible as a contribution to philosophy and psychology, the book is noteworthy only in being symptomatic of the pitiful plight of German intellectual life today.

OTTO F. KRAUSHAAR

SMITH COLLEGE

Kant: Le conflit des facultés en trois sections, 1798. Traduction avec une introduction et des notes par J. GIBELIN. Paris, J. Vrin, 1935. Pp. xii, 148.

This is a clear and accurate translation of the last philosophically significant work produced by Kant. Starting from the external and practical relations of the "upper" faculties of theology, law, and medicine, with the "lower" philosophical faculty, Kant denies to the former (especially to theology and law) any right whatever to limit or dictate to the pure theoretical faculty. In this way he not only resolved his personal conflict with a politically promulgated religious orthodoxy, but provided the opportunity for a final restatement of his basic humanism: the progress of free, self-determined, rational beings towards eternal peace. The translator has added a sympathetic introduction and some clarifying notes.

OTTO F. KRAUSHAAR

SMITH COLLEGE

Le cycle de l'inconscient. Par ÉMILE LUBAC. Paris, Félix Alcan, 1934. Pp. 194.

This book continues the author's previous studies on the levels of consciousness and the dimensions of duration. It investigates how the personal past, normally unconscious, realizes itself sporadically in a passing present and again sinks into the depths of the unconscious. It is this personal past which gives personality its dimensions and substance. The clue to its functioning lies in the fact of recognition. The cycle is based on its inner mani-

festations in dream life, in creative inspiration, and in the genesis of subjective duration. It is studied also from the point of view of historical cycles, of the community life, and of the expansion of inner duration into objective time of which the personal is a small part.

E. T. MITCHELL

UNIVERSITY OF TEXAS

Pensée et re-creation. Par PHILIPPE FAURÉ-FREMIET. Paris, Félix Alcan, 1934. Pp. xii, 132.

This work is based on the data of pure introspection; it combines a fine taste for the arts with an application of Bergsonian principles. Appreciation and enjoyment of an artistic production, the author asserts, involve re-creation; and he illustrates his thesis by turning rapidly from music to automobiles and to the stage. In seeing a movie, for example, you see movement from the series of static pictures, not because of an illusion, but because you yourself re-create the movement. In fact, in all thought as well as in art there must be re-creation which is more than mere repetition.

E. T. MITCHELL

UNIVERSITY OF TEXAS

La nature: conception et morale biologiques. Par CHARLES NICOLLE. Paris, Félix Alcan, 1934. Pp. 134.

The first part of the book develops a biological conception of nature. It rules out such human value-terms as beautiful or ugly, good or bad, but finds life to be characterized by continuity, plasticity, illogicality, equilibrium, etc. The author adopts the unusual view that life itself is eternal and underived either from matter or spirit. The second part applies these notions to morality. Conscience, for example, is the sense within us of the equilibrium necessary to the normal exercise and conservation of life. Satisfaction and joy are signs of repaired damage. Vengeance is an instinctive attempt at restoration and underlies rational justice. A biological attitude towards life would involve, first, an acceptance of life rather than hedonistic retreat or religious resignation, second, the cultivation and betterment of our personal qualities, and finally, enjoyment of our rôle as a phase of the eternal life of nature.

E. T. MITCHELL

UNIVERSITY OF TEXAS

The Philosophy of Religion versus the Philosophy of Science. By ALBERT EAGLE. Privately printed, 1935. (Obtainable through all booksellers from Simpkin Marshall, Ltd.) Pp. 352.

The author writes without calm. His criticism is directed against pseudo-scientists in biology, philosophy, psychology, physics, and especially the materialists. The impression produced is that the author's reading has been wide but too much influenced by passion. The net result of his judgments is sketchy. Not all contemporary materialists are as bad as he represents them. The author's strongest argument is to be found in mathematics rather than in the philosophy of religion. His objection to premature scientific judgments is well taken; but the manner of it is open to criticism.

Editorial pruning would have greatly helped the literary quality of his effort.

VERGILIUS FERM

THE COLLEGE OF WOOSTER

La philosophie scientique: vues nouvelles sur ses buts et ses méthodes. Par HANS REICHENBACH. Traduction d'ERNEST VOUILLEMIN. Introduction de MARCEL BOLL. Paris, Hermann & Cie, 1932. Pp. 44.

The new scientific philosophy refuses to deal with abstract speculation and attempts merely to develop a method of analysis and to apply it to scientific knowledge. The antipathy of the scientist to traditional philosophy is, to a degree, justified, but if this antipathy were extended to include the new scientific philosophy, it would deprive science of a powerful instrument of analysis. It is true that the form of scientific knowledge should be ancillary to its content; with the alteration of the content there is always a corresponding and continual evolution of scientific formalism, and this last always introduces new questions concerning the theory of scientific knowledge. The analysis of knowledge thus proposed by the new philosophy does not imply an analysis of "reason", because the philosophy of science is solely concerned with the individual products of intellectual activity. Hence it will attempt to discover the postulates of a particular scientific system merely, and not the postulates of all science. It therefore rejects the idea of *a priori* philosophical laws anterior to all science.

The author successively applies the logico-analytical methods of scientific philosophy to the Darwinian theory of natural selection, vitalism, the concept of *Gestalt,* and the notion of the biological individual. It is shown that the philosophical interpretations of these ideas depend on the neglect or misunderstanding of the facts, or on both. The author devotes some consideration also to the relation of physics and geometry, the problem of causality, and mathematics. The fundamental problem of the philosophy of mathematics is correctly and succinctly stated to be the question whether the mechanism of a logico-mathematical calculus guarantees the observance of the principle of non-contradiction. On the other hand the treatment of the notion of reality is far from adequate even for an elementary treatise, and the representation of Professor Carnap's former views on this head is somewhat inexact.

JULIUS RUDOLPH WEINBERG

ZANESVILLE, OHIO

La logique de la science et l'école de Vienne. Par ERNEST VOUILLEMIN. Paris, Hermann & Cie, 1935. Pp. 46.

The author of this brochure briefly sets forth the objectives of the Viennese Circle and examines the claims and achievements of this group. He finds that the wholesale dismissal of metaphysics as nonsense is highly questionable. The difference between the logically meaningless and the psychologically meaningless is emphasized, but it is clear that this difference has not been overlooked by Carnap, Schlick, and other members of the Circle. If scientific knowledge is limited to that which can be intersubjectively con-

trolled, it has a probable value merely; the proponents of the unity of science must take this into more serious account than hitherto has been the case. The difference between the physical and the psychological is fundamental, and it is impossible to establish an intersubjective language without recognizing this fact. Some of the objections here raised against the doctrines of the Vienna group are valid and have, in fact, been the occasion for subsequent modifications of physicalism. Others seem to the reviewer to depend on criticisms of popular and necessarily inexact formulations of their views.

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Sur le fondement de la connaissance. Par MORITZ SCHLICK. Paris, Hermann & Cie, 1935. Pp. 58.

This collection of essays includes a translation of "Ueber das Fundament der Erkenntnis" (*Erkenntnis*, Band IV), a translation of a short article in *Analysis*, Volume II, and of an essay not published elsewhere. The author replies to the doctrine of physicalism, construed here *inter alia* as a method of scientific research which attempts to construct a system of sentences consistent with and comprehending the protocol sentences, rather than as a method of establishing a connection of scientific systems with the empirical facts. He finds many points of similarity between this doctrine and the coherence-theory of truth and raises some of the stock objections to this theory, in particular, that it offers no unique criterion of empirical truth. From this it follows that there is no firm foundation of scientific knowledge. Professor Schlick suggests that we must therefore allow certain synthetic assertions, the so-called *constatations*, which are irrefutable, directly and completely represent empirical data, and so form the basis of any scientific system. His argument that there are such *constatations* is simply that it is absurd to use "it seems" or "probably" in connection with sentences directly about sense-data. This argument will already be familiar to the reader of Price's *Perception*. While the negative force of this critique is well taken, the positive theory of *constatations* seems open to question. If the meaning and truth of such a proposition is exhausted in the moment of direct sensing, it is of no significance for intersubjective knowledge, although everything that Professor Schlick says about it is undoubtedly true; whereas if the proposition has meaning and truth beyond this moment, it is not irrefutable. A further delineation of the nature of protocol-sentences is necessitated as a result of this critique, even though the positive suggestions seem somewhat unsatisfactory.

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ZANESVILLE, OHIO

Le phénomène de l'art. Par GEORGES MOTTIER. Paris, Boivin & Cie, 1936. Pp. 240.

This book has two parts. The first summarizes the esthetic views of outstanding modern German and French thinkers, chiefly Kant, Schiller, Hegel, Schopenhauer, and Lipps, Taine, Guyau, Bergson, and Lalo. The second part sketches a solution of various esthetic problems, and contains four chapters which discuss respectively the esthetic activity, art and knowledge,

the problems of beauty, and the evolution and future of art. Mottier advocates an intuitionist theory of esthetic activity. But, instead of following a modern French or German intuitionist, such as Bergson or Schopenhauer, he follows Croce. In Mottier's view, the essence of esthetic activity is not a passive apprehension of reality liberated from the distortions of practical interest (Bergson) or from the cravings of will (Schopenhauer). Its essence is rather the overt making of new images out of reality, or creating ceaselessly from the stuff of experience "des visions intérieures" (149).

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The following books have been received:

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A Primer for Critics. By GEORGE BOAS. Baltimore, The Johns Hopkins Press, 1937. Pp. x, 154.

The Logical Syntax of Language. By RUDOLF CARNAP. Translated from the German by AMÉTHE SMEATON. The International Library of Psychology, Philosophy, and Scientific Method. New York, Harcourt, Brace and Company, 1937. Pp. xxvi, 352.

Authority and the Individual. Harvard Tercentenary Publications, Vol. II. by various authors. Cambridge, Harvard University Press, 1937. Pp. x, 372.

Procedures and Metaphysics. A Study in the Philosophy of Mathematical-Physical Science in the Sixteenth and Seventeenth Centuries. By EDWARD W. STRONG. Berkeley, University of California Press, 1936. Pp. viii, 302.

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Yoga. A Scientific Evaluation. By KOVOOR T. BEHANAN. New York, The Macmillan Company, 1937. Pp. xxii, 270.

The New City. By NATHAN FIALKO. New York, Margent Press, 1937. Pp. viii, 154.

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Philosophy. Edited by GAIL KENNEDY. Garden City, Doubleday, Doran and Company, Inc., 1937. Pp. xliv, 394.

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La pensée religieuse de Montaigne. Par MATURIN DREANO. Paris, Gabriel Beauchesne et ses fils, 1936. Pp. iv, 502.

La psychologie de Condillac. Par GEORGES LE ROY. Paris, Boivin & Cie, 1937. Pp. vi, 240.

L'expérience de l'effort et de la grace chez Maine de Biran. Par GEORGES LE ROY. Paris, Boivin & Cie, 1937. Pp. vi, 444.

Morale theorique et science des mœurs. Par GEORGES GURVITCH. Paris, Félix Alcan, 1937. Pp. vi, 200.

Œuvres de Maine de Biran. Accompagnées de notes et d'appendices publiées avec le concours de l'institut de France. Tome X. Par PIERRE TISSERAND. Paris. Félix Alcan, 1937. Pp. lxii, 398.

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Contemplation et vie contemplative selon Platon. Par A. J. FESTUGIÈRE. Paris, J. Vrin, 1936. Pp. ii, 494.

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La pedagogia di Antonio Rosmini e le sue basi filosofiche. Per MARIO CASOTTI. Milano. Società Editrice "Vita e Pensiero", 1937. Pp. viii, 192.

La vita come ricerca. Per UGO SPIRITO. Firenze, G. C. Sansoni, 1937. Pp. 238.

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Sul concetto di luce naturale e su altri concetti fondamentali della gnoseolgia del Descartes. Per ADOLFO LEVI. Estratto dalla *Rivista di Filosofia,* XXVIII, 1. Milano, 1937. Pp. 20.

Sull'importanza che platone attribuiva ai propri scritti e sul valore che essi hanno come espressione del suo pensiero. Per ADOLFO LEVI. Estratto dai *Rendiconti,* LXIX, 6-10 e 11-15. Milano, 1936. Pp. 22.

NOTES

The following is a list of articles in current philosophical periodicals:

MIND XLVI 182: *A. E. Taylor,* Some Incoherencies in Spinozism (I); *C. T. Krishanama Chari,* An Epistemological Approach to the Special Theory of Relativity; *A. A. Luce,* The Unity of the Berkeleian Philosophy (II); *Morris Lazerowitz,* Tautologies and the Matrix Method; *M. J. Levett,* Note on the Alleged Cartesian Circle; *F. L. Cross,* Kant's So-called Copernican Revolution; *Heinrich Behmann,* The Paradoxes of Logic.

PHILOSOPHY XII 46: *Eustace Percy,* Culture, Philosophy and Faith; *Wm. Pepperell Montague,* The Story of American Realism; *John Laird,* Contemporary British Realism; *B. M. Laing,* Hume's Dialogues Concerning Natural Religion; *D. J. Allan,* Nature, Education and Freedom According to Jean-Jacques Rousseau; *Canon Oliver Quick,* Knowledge, Action and Religion; *The Archbishop of York,* Discussion: Both God and Man—A Reply.

THE JOURNAL OF PHILOSOPHY XXXIV 5: *Harold Chapman Brown,* Ethics from the View Point of Modern Science; *J. W. Miller,* Accidents Will Happen. 6: *W. Donald Oliver,* Substance as a Locus of Meaning; *Newton P. Stallknecht,* The Place of Verification in Ethical Theory. 7: *Milton R. Konvitz,* An Examination of Professor S. Alexander's Theory of Truth; *Arthur Lapan,* The Causal Situation. 8: *George Boas,* What Is a Problem?; *Mortimer Taube,* Positivism, Science, and History; *Herbert W. Schneider,* Laird's Enquiry into Moral Notions.

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SCIENCE AND SOCIETY I 1: *Theodore B. Brameld,* American Education and the Class Struggle; *Margaret Schlauch,* The Social Basis of Linguistics; *V. J. McGill,* An Evaluation of Logical Positivism; *D. J. Struik,* Concerning Mathematics. 2: *Lancelot Hogben,* Our Social Heritage; *John Darrell,* The Economic Consequences of Mr. Keynes; *Leo Roberts,* The Meaning of Change in Contemporary Philosophy; *Richard Enmale,* Interpretations of the American Civil War; *Hyman Levy,* Probability. 3: *Louis B. Boudin,* The Supreme Court and Civil Rights; *Paul Radin,* Economic Factors in Primitive Religion; *Carl T. Schmidt,* Agricultural Property and Enterprise under Italian Fascism; *Edgar Johnson,* Henry Adams; *Oliver Larkin,* The Daumier Myth; *James S. Allen,* The Struggle for Land During the Reconstruction Period.

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THE NEW SCHOLASTICISM XI 2: *G. Théry,* Thomas le Cistercien: Le commentaire du Cantique des Cantiques; pour dissiper une équivoque; *Virgil Michel,* Towards a Vital Philosophy; *John J. Toohey,* Kant on the Propositions of Pure Mathematics.

ANGLICAN THEOLOGICAL REVIEW XIX 2: *Charles Morris Addison,* Mother Julian of Norwich and Robert Browning; *Donald B. Aldrich,* An Outline of the Church Congress; The Basis of Christian Faith and Action Today (Syllabus): 1. *Frederick C. Grant,* The Permanence of Christianity; 2. *Joseph F. Fletcher,* The Basis of Christian Faith and Action Today.

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SPECULUM XII 2: *Rudolph Willard,* The Latin Texts of *The Three Utterances of the Soul; Henry S. Lucas,* Mediaeval Economic Relations between Flanders and Greenland; *Vincent B. Redstone* and *Lilian J. Redstone,* The Heyrons of London; *Evan J. Jones,* The Authorship of the Continuation of the *Eulogium Historiarum; Eva M. Sanford,* The Lombard Cities, Empire, and Papacy in a Cleveland Manuscript; *Thomas P. Chalker,* Matthew 13:55—28:20 in Two Unpublished Vulgate Manuscripts; *William H. Cornog,* The Poems of Robert Partes; *H. D. Austin,* Artephius—Orpheus; *Robert L. Reynolds,* Two Documents on Education in Thirteenth-century Genoa; *Leslie Webber Jones,* More about the London Vitruvius; *George*

R. Stephens, A Mediaeval Game in Use Today; *Lynn Thorndike*, Copyists' Final Jingles in Mediaeval Manuscripts.

ANALYSIS IV 2 & 3: *A. J. Ayer, C. H. Whiteley, M. Black*, Truth by Convention: A Symposium; *M. MacDonald*, Language and Reference; *H. B. Acton*, The Expletive Theory of Morals; *C. D. Hardie*, The Formal Mode of Speech.

THE BRITISH JOURNAL OF PSYCHOLOGY XXVII 4: *O. A. Oeser*, Methods and Assumptions of Field Work in Social Psychology; *Douglas Fryer*, Specific Conscious Intent and its Correlates in Performance; *W. D. Wright*, Non-Homogeneous Sensations: A New Theory of Sensation Discrimination; *Mary L. Northway*, The Nature of 'Difficulty'; with Reference to a Study of 'Whole-Part' Learning; *Henry Binns*, Visual and Tactual 'Judgment' as Illustrated in a Practical Experiment; *J. N. Langdon*, A Two-Factor Study of Simple Motor Tests with Particular Reference to Practice and Prognosis; *George Seth*, Psychological Aspects of Contemporary Poetry.

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JOURNAL OF EXPERIMENTAL PSYCHOLOGY XX 4: *J. P. Guilford* and *H. M. Nelson*, The Pitch of Tones in Melodies as Compared with Single Tones; *E. G. Wever, C. W. Bray*, and *C. F. Willey*, The Response of the Cochlea to Tones of Low Frequency; *C. H. Crudden*, Reactions of Newborn Infants to Thermal Stimuli Under Constant Tactual Conditions; *Alfred H. Holway, Janet E. Smith*, and *Michael J. Ziegler*, On the Discrimination of Minimal Differences in Weight: II. Number of Available Elements as Variant; *E. Raskin* and *S. W. Cook*, The Strength and Direction of Association Formed in the Learning of Nonsense Syllables; *R. W. Gilbert*, A Further Study of the Effect of Non-Informative Shock upon Learning.

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ter on the Stanford-Binet; *Herbert H. Jasper* and *Edward T. Raney*, The Physiology of Lateral Cerebral Dominance. 4: *Christian A. Ruckmick*, Carl Stumpf; *G. H. S. Razran*, Conditioned Responses: A Classified Bibliography.

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Erkenntnis V 4: *Karl Dürr*, Die Bedeutung der Negation. Grundzüge der empirischen Logik; *Carl G. Hempel*, Über den Gehalt von Wahrscheinlichkeitsaussagen; *Hans Reichenbach*, Bemerkungen zu Carl Hempels Versuch einer finitistischen Deutung des Wahrscheinlichkeitsbegriffs; *Hans Reichenbach*, Über Induktion und Wahrscheinlichkeit.

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Die Tatwelt XXXIII 1: *Willy Hellpach*, Die Wissenschaftstheorie vom zentralen Gegenstand; *René Le Senne*, La Relation idéo-existentielle; *G. H. Heer*, Die Dichtung im Recht; *Thaddäus Zielinski*, Wert und Wirklichkeit des deutschen Neuhumanismus.

Rivista di Filosofia XXVIII 1: *P. Martinetti*, La morale secondo W. Schuppe; *A. Levi*, Sul concetto di luce naturale e su altri concetti fondamentali della gnoseologia del Descartes; *A. Poggi*, Pensiero e Universo secondo M. Blondel; *F. Federici*, Kant e le beghe dei suoi studenti.

Giornale Critico della Filosofia Italiana IV 6: *P. Carabellese*, Il mio ontologismo; *G. Fano*, Prolegomeni alla "Filosofia perenne". Osservazioni sulla metafisica del Prof. Orestano.

Rivista di Filosofia Neo-Scolastica XXIX 1: Cronaca della Facoltà di Filosofia e della Facoltà di Pedagogia dell'Università Cattolica del Sacro Cuore; *Grazioso Ceriani*, Religione e filosofia nel pensiero idealistico e nella gnoseologia tomistica; *Leon Veuthey*, L'esprit du concret; *Marian Heitzman*, La libertà e il fato nella filosofia di Marsilio Ficino; *Carmelo*

Ottaviano, Riflessioni sulla polemica Orestano-Olgiati; *Francesco Olgiati*, Il punto di partenza del concetto di "realismo".

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GREGORIANUM XVIII 1: *S. Tromp*, Ecclesia Sponsa Virgo Mater; *A. M. Vitti*, La conoscenza del vero messianismo dei vaticini presso i Profeti; *H. Lennerz*, Die Collectanea Peñas; *T. Spáčil*, Fides catholica S. Ioannis Chrysostomi et recens quoddam opus auctoris orthodoxi. III. De processione Spiritus Sancti, de Sacramentis, etc.; *P. Dudon*, Amis Italiens de Lamennais. Lettres inédites; *J. A. de Aldama*, 1ª. Clementis; *C. Giacon*, Il secondo congresso tomistico internazionale.